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INTERNATIONAL TRUCKS

COMMERCIAL CAR JOURNAL

Vol. LXVII, No. 6 August, 1944

WASHINGTON RUNAROUND

Truck Tire Crisis . . . Quotas Kid Public . . . Proposed Essentiality List . . . Tires Only for Group 1 . . . Carriers Favor Pool . . . Army Won't Aid Civilians . . . 1945 First Quarter: 56,700 Trucks . . . '44 Truck Output Lags . . . Truck Allocation Reforms . . . Etc., Etc.

by GEORGE T. HOOK

Truck Tire Crisis

The truck tire crisis had Federal agencies by the throat during the better part of July and all signs indicated that the pressure would increase until truck operators had been provided with some relief. Under consideration were a new tire essentiality list based on the type of commodity hauled and a proposal that all 8.25-20 and larger tire production be pooled and doled out to bring back into operation vehicles that were out of service only for lack of tires. There was also pronounced sentiment that the Army was sitting on top of a large inventory of commercial tires that would do the nation a lot more good on civilian trucks than stored away in Army depots. There were signs that the Army was being jockeyed into an uncomfortable position and that it would either have to dip into a stockpile that is suspected of being excessive or see its own military production program affected by trucks going out of service for want of tires.

OPA Quotas Kid Public

The crisis was its own proof that the Office of Price Administration has been kidding the public and the ODT with its truck tire allocations; and back of the OPA is the War Production Board and its Office of Rubber Director, which sets the quotas. The ODT, as a claimant agency, has estimated that 135,000 tires in the 8.25 and up bracket are needed monthly to keep essential trucks operating. In June 125,000 tires of these sizes were allocated by OPA and in July the quota was jumped to 135,000. Local OPA boards have been issuing certificates in line with these quotas, but production has lagged far behind. Stories conflict as to what the actual production is, but they seem to wash out at around 60,000 tires monthly. At this rate OPA boards would have issues 260,000 certificates in the months of June and July against a production of 120,000 (certainly no more than 150,000). Indicating that more than 100,000 "hunting licenses" had been issued operators who were doomed to disappointment. The effect of this was beginning to be felt in Washington early in July. Reports were pouring in that trucks were being laid up for lack of tires. The Army was particularly concerned over reports that many tank trucks were going out of service. It was conducting its own investigation of some of these reports and it was back of surveys being made by truck operator organizations. One of these organizations said that spot checks showed that around 2000 trucks were out of service for lack of tires around the middle of July. On all sides it was admitted that the situation was certain to become progressively worse.

Proposed Essentiality List

It was also admitted that the plans under discussion would provide no overall relief; they were merely intended to place the limited quantity of tires where they would do the most good. One plan was the new essentiality list devised by WPB and tossed to all interested Federal agencies for their views. This department learned that in this list commodities were preferentially rated from 1 to 5 and according to over-the-road, wholesale and retail service. Petroleum products (tank truck operators) were rated No. 1 as were human

WASHINGTON RUNAROUND

(CONTINUED FROM PAGE 35)

cargo haulers—buses and taxis. Intercity trucking was rated No. 2 and so were most of the haulers of foods. Local drayage again took a rap over already bruised knuckles by being rated No. 3, as was household goods moving. Non-alcoholic and alcoholic beverages were rated No. 5. The list of commodities was longer than King Kong's right arm and just as hairy. It was getting a thorough combing out in ODT circles at last report. Most significant of all, ODT's executive line up of "trolley-car conductors" in their first test on a controversial matter involving motor trucks, were said to be ringing the bell with a stand that there be no partiality among carriers hauling essential commodities. They appeared to be part of a majority ODT feeling that all carriers hauling war goods and foods be rated No. 1.

Tires Only for Group 1

But it was evident that this essentiality list, no matter how it was combed, sliced and recast, would provide only a partial answer to the problem. For instance, if the list stood without change, there would be only enough 8.25 and larger tires to take care of the needs of operators in the No. 1 group. Their needs are estimated at 57,000 tires monthly. The important operators in the No. 2 group, including most intercity haulers and wholesale food distributors, would be out of luck completely in a program that saw only 60,000 such tires produced in a month. And lumping the No. 2's with the No. 1's would only pose another problem.

Carriers Favor "Pool"

Representatives of for-hire carriers were chagrined (to use the mildest term imaginable) that, with the exception of tank truck operators, their charges were tossed into the meaningless No. 2 position. They were pleased that ODT shared their displeasure but they were farsighted enough to see that a lumping of 2's and 1's would get everybody nowhere fast. They seemed to be in favor of a pooling plan, whereby the available tires would be handed out only on showing that a truck was down and out for a lack of them. There was even hope that the pooling plan might provide spares in cases of dire need, but it seemed like a forlorn hope. The outlines of the plan were very rough and details completely lacking. The plan did not seem to have backers in official quarters.

Army Won't Aid Civilians

From all this it can be seen that only the Army with its stockpile of commercial-type tires is in position to provide any satisfactory measure of relief. In one quarter this department heard that the Army stood ready to release 40 or 50 thousand tires for civilian use but only after it had satisfied itself that a bona fide emergency existed and had received assurances that operating abuses would be curbed. The Army was creating the production problem with its greatly expanded bomber and artillery tire program and its heavy truck program, and, in the face of a European military situation that demanded full pressure, there was no reason to believe that the Army would order a retreat from its rigid position and give out with the "doughnuts."

'45 First Q.: 56,700 Trucks

Because the Army (apparently influenced by events in Europe) has not yet come through with its truck production plans for 1945, the War Production Board has contented itself with setting up only the 1945 first quarter quotas for civilian truck production. Total truck production planned for the first quarter is, in round numbers, 56,700, broken down as follows: 40,000 medium, 13,365 light-heavy and 3335 heavy. Request of the ODT for 41,000 light trucks was denied. Somehow this request for light trucks got tied up with farm tractor production which, it is interesting to note, has been exceeding WPB quotas. WPB seemed to take the stand that, in view of the malleable casting situation, farmers can't have both farm tractors and trucks. ODT has ferreted out the fact that farm tractor production falls off in the first quarter of the year and is back at WPB to reconsider its light truck request. The manufacturers who make the farm tractors also make light trucks.

'44 Truck Output Lags

This year's civilian truck production is lagging behind schedule. In the first quarter of 1944 the WPB program called for 11,121 medium, light-heavy and heavy trucks. Actual production was 9923. This is 10 per cent off. The program for the second quarter calls for 32,194 trucks. In the first two months of that quarter only 16,746 were produced, according to published figures. Medium and light-heavy production was far behind schedule, and heavy-heavy production looked as if it would meet the schedule and even make up for some of the first quarter loss.

X-Day Cutback Plans

The WPB is reported working up cutback plans to become effective X-Day, when Germany tosses in a gorey sponge. These will be presented to the Production Executives Committee. Some dopesters figure that Detroit will take a 50 per cent cutback in military production.

Trailer Quotas on Trial

Trailer production in the first half of 1945 has been set by WPB at 13,000 units. At the same time WPB has suggested a review of the 1944 program, looking toward a reduction of allotments on the premise that programmed schedules are not being met and are out of line with demand.

Truck Allocation Reforms

The ODT is working on a revision of the new truck application form to save manpower, time, paper and money—all very worthy objectives. The form under consideration would

(TURN TO PAGE 244, PLEASE)

EDITORIALS

The Tire Crisis

IT will not be news to fleet operators that the OPA has been kidding them with its truck tire quotas. Fleet operators have too many "hunting licenses," otherwise known as ration certificates, not to be aware that something was amiss. That something, it turns out, was tire quotas which met ODT's demands, but which were far in excess of tire production. As a result, it is estimated that at this moment there are more than 100,000 more certificates for 8.25 and up tires in the hands of operators than there are available tires.

This has resulted in what, in official Washington circles, is frankly spoken of as a crisis. More and more trucks are being tied up for want of tires and a serious situation is feared unless relief is provided.

Truck operators are not being blamed for the crisis, although OPA, ODT, ORD and WPB are aware that not all operators have exhausted the possibilities of getting maximum mileage out of their tires with the right kind of care and maintenance. This time the responsibility rests on broad shoulders that are well able to bear the burden—the Army. Its demands on tire manufacturers are so great and the facilities of manufacturers are so limited because of inadequate manpower and production problems that civilian truck tire requirements are taking the rap.

However, no matter what is done to cope with the crisis—whether the Army decides that it can afford to let go of some of its precious hoard or eligibility for available tires is set up on a new commodity basis—fleet operators should take warning from the critical situation and redouble their tire conservation efforts. It seems entirely probable that most of the "hunting licenses" now in the hands of operators will be cancelled and a fresh start made to limit the issuance of certificates to the greatly limited production. This will definitely mean a more careful selection of eligibles and insistence on practices which will shorten the chances of procurement for those who disregard them. Operators should not be surprised if the 20 per cent load premium is removed by ODT or if the 35-mile speed limit is enforced. Both are tire-mileage consuming factors which, under existing conditions, should be controlled by operators themselves.

The problem now for the vast majority of operators is not one of putting up with inferior wartime tires in the larger sizes; it is one of getting along without any new tires.

Accessibility: A Selling Job

IN all current discussions seeking to influence the post-war design of motor trucks the important factor of maintenance accessibility is stressed. There is no doubt that mechanics, shop foremen, supervisors and fleet superintendents favor design that provides greater accessibility. They are intimately acquainted with the headaches of inaccessibility, with the time that is wasted, with the money that is spent on redesign in fleet shops.

There is still a question whether their superiors, the men who sign the checks, are prepared to pay for the higher cost of accessible design.

Although there is ample evidence to make one suspect the contrary, the engineers who design trucks do not approach their task with the deliberate intention of making accessories difficult to service, parts a problem to repair or replace and certain items of inferior materials. Design is the product of many minds and as such it represents a compromise. And because the compromise in the past has resulted in designs that leave much to be desired in the way of accessibility, it is to be assumed that its salability has been doubted by the manufacturers themselves.

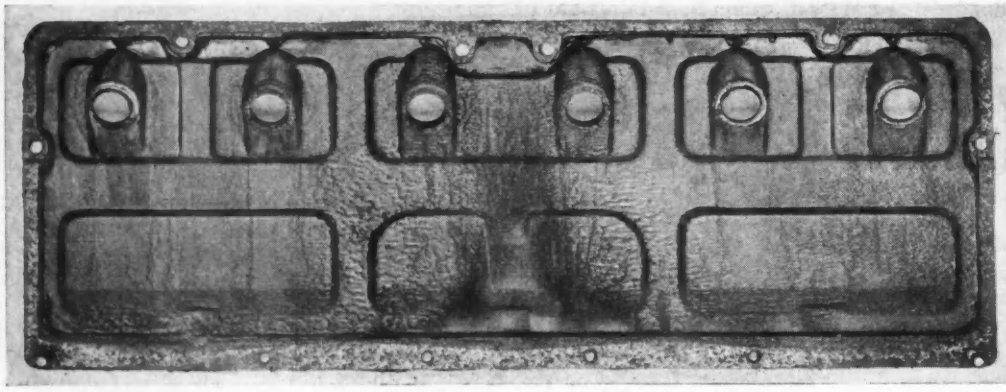
The engineering head of one truck company recently stated the problem in these words: "There is no doubt that the accessibility question has been dodged. Some of us are honestly trying to improve conditions. However, the designer is handicapped, having no control over some of the factors involved. The problem is to translate accessibility into sales volume."

This simply proves that there is an educational job that must be done. It is a job in which the men who do the actual work of maintaining trucks can play a major part. In fact they must play the part if they are to get what they want.

It seems that in this educational process each fleet shop should accumulate evidence on each make of truck that will support the contention that maintenance inaccessibility is costly and should be taken into consideration when new truck purchases are being made. This evidence should represent a complete record of the maintenance difficulties that were encountered; the time consumed and the cost of performing work under those difficulties; the alterations in design that were necessary in order to promote efficient servicing; the cost of such alterations and the time and cost savings they accomplished, etc., etc.

Such evidence should go far toward convincing the boss that a better design would save him money in the end. Once this conviction becomes apparent to the truck salesman it will filter back to the factory sales department and the engineers will have a freer hand in doing what they'd much prefer to do.

Admittedly, this is only one way of attacking the educational problem. But something like it seems absolutely necessary if the men in the shop are to have the better life that they are now striving for. Otherwise bosses will behave post-war as they behaved pre-war, with thoughts centered solely on initial investment.



Figs. 5 & 6 showing effect on pushrod cover and piston of a heavy-duty oil, containing both oxidation inhibitor and detergent in 10,698 miles without drain, which is too much, although effect was better than in similar test with straight oil

Controlling Hot Engine Sludge

High quality oil, filtered, and drained at proper intervals, plus engine temperature control recommended by an automotive engineer for effective results

by H. C. MOUGEY

Research Laboratories Division, General Motors Corporation

H. C. Mougey

HOT Engine Sludge and Cold Engine Sludge are different in cause and in composition, but the sludge in an engine is usually a mixture of both types in various proportions. The problem of control of either type usually involves controlling both types.

The principal differences between Hot Engine Sludge and Cold Engine Sludge is that Hot Engine Sludge contains large amounts of resins resulting from the oxidation of the oil in the crankcase, but it is relatively free from water and soot. Cold Engine Sludge contains large amounts of soot and usually it also contains water, but it is relatively free from resins resulting from the oxidation of the oil.

Four general methods have been recommended for controlling Hot Engine Sludge. These methods are:

1. Filters
2. Temperature Control
3. Crankcase Draining
4. High Quality Oil ("Heavy Duty" Oil)

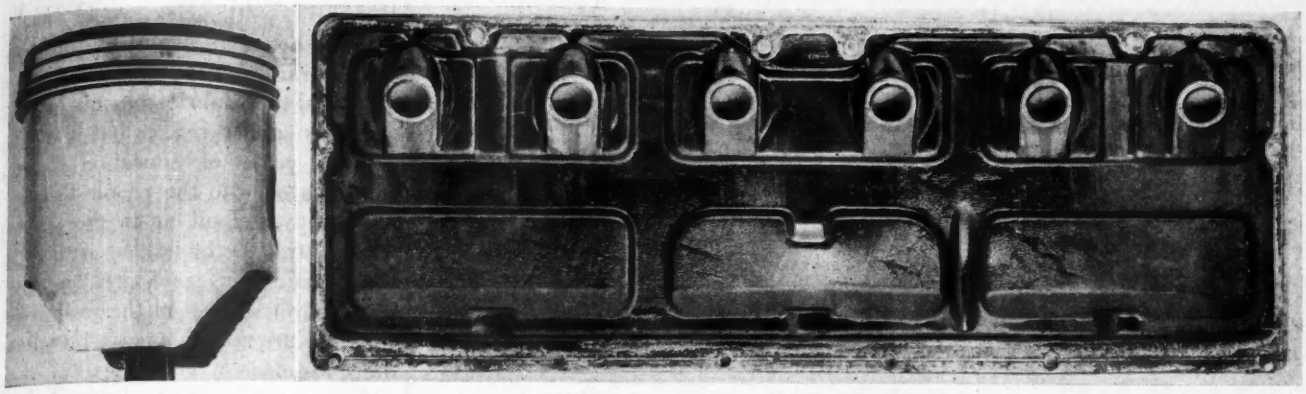
1. *Filters.* Try to remove the sludge from the oil as fast as it forms by the use of some suitable means, such as filters, if the quality of the oil, the operating conditions, the kind of filter, and the method of use of the filter make this method practicable.

2. *Temperature Control.* Keep the oil temperature low enough so that the oil will not oxidize. Of course, any system that is used to keep the oil temperatures down must not cause trouble by letting the temperatures be so low in winter or under light driving conditions that Cold Engine Sludge troubles result. "Jumping from the frying pan into the fire" is not considered to be a good idea, but jumping in the reverse direction, from Hot Engine Sludge troubles to Cold Engine Sludge troubles may be just as poor an idea.

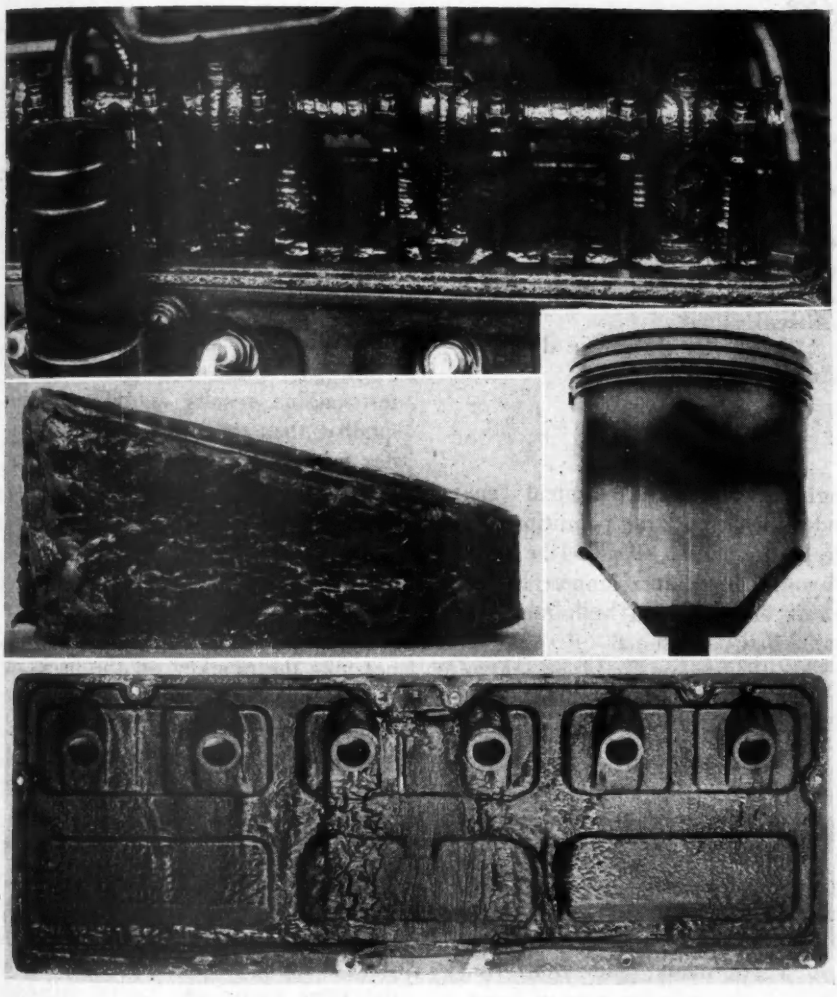
One method of keeping the oil temperatures down is to decrease the maximum speed and power at which the engine is operated. This is actually being done with passenger cars

"In Hot Engine Sludge the oxidation products of the oil are the principal cause of trouble. The general methods recommended for controlling this sludge are:
"1. Filters
"2. Temperature Control.
"3. Crankcase Draining
"4. High Quality Oil ('Heavy Duty') Oil
"Regardless of what is done in regards to the first three of these methods, the most important method of control is use of high quality ('heavy duty') oil."

Excerpts from a paper presented at the SAE National Transportation & Maintenance meeting, Philadelphia, Pa.



Figs. 7 & 8 above offer proof that at 5,103 miles of operation without drain the same heavy-duty oil referred to in Figs. 5 & 6 is in excellent condition. This does not mean 5000 would be a safe drain period. See article for author's recommendation



At left: Top, Fig. 1; center, Figs. 2 & 3; bottom, Fig. 4. All these illustrations show effects of operating with highly refined, high viscosity index oils without any additives. Fig. 1 shows the sludging caused in 6326 miles without a drain. The oil screen in Fig. 2 and piston in Fig. 3 are from an engine operated 8418 miles without draining. Fig. 4 push-rod cover shows sludge accumulated in two drain periods, the first at 9261 miles and the second at 10,823. These tests prove that drain periods of this length are too long when oil of this quality is used

at the present time, due to war regulations in regard to maximum car speeds. Of course, these regulations do not limit the maximum oil temperatures of trucks and buses, where the temperatures may still be high even at moderate vehicle speeds, due to severe loads and operating conditions. I doubt whether they would be satisfied, under normal conditions, to limit their car speeds just to permit them to use an oil of poorer quality, so this method of limiting the oil temperatures will probably not be of much interest under post-war conditions.

3. *Crankcase Draining.* Drain the crankcase frequently enough to prevent the amount of sludge from becoming too large. This drain period will depend upon the quality of the oil and the severity of the operating conditions. With lower quality oils and with more severe operating conditions, the drain periods should be shorter.

It is just as dfficult to make a definite recommendation for a time or mileage limit for draining all crankcases with all oils, which vary in quality, and with all engines, which are operated under different conditions, as it would be to set a definite time limit on how frequently everyone in the world should send their clothes to the laundry of the dry cleaners. The dirty oil should be drained from an engine before the dirt has become so solid or before it adheres so tightly to the engine parts that it will not be removed on draining. It appears that a single drain period based on either time or mileage, or both, is bound to be unsatisfactory because it probably cannot be low enough to take care of the extreme cases without being so low that no one would pay any attention to it for average operating conditions.

Back in the pre-war days, when it was common practice to operate passenger cars under rather severe high speed conditions, we made a number of tests that may be of interest. The results of some of these tests are

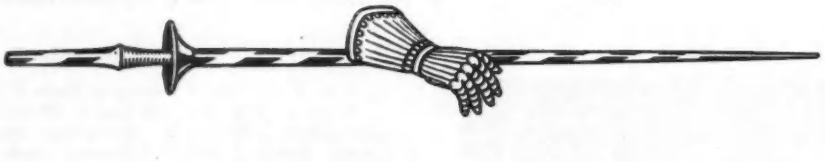
(Turn to Next Page, Please)

A Challenge

To Engine Builders and Petroleum Refiners

by GERTHAL FRENCH

Manager, Lubricant Department, Richfield Oil Corp.



"Today, the operator asks the oil representative 'When should I change the oil?' The oil representative then asks his laboratory, which in turn asks the Technical Department, which in turn asks the Sales Department, which in turn asks the Management—because this is a hot question of policy—and on and on it goes; and no one—and this includes me, too—is in a position to give the answer.

"What a fine kettle of fish for two big industries — the engine builders and the petroleum refiners—to be in. Talk about politics!

"Well, why don't we do something about it?"

MR. MOUGEY'S paper, titled "Hot Engine Sludge and Its Control," is very instructive, but it still leaves the individual *operator* hanging in the air, so far as oil changes and actual engine temperature control is concerned.

As an example: if one uses a quality oil, then it can be changed less frequently, depending, of course, upon the mechanical condition of the engine, the type of service that it performs, the climatic condition in which it operates and finally the operator himself.

The same set of conditions will, of course, have a bearing on the oil-change period when a lower quality oil is used. Thus, if one operates engines in good mechanical repair under ideal operating conditions then the lower quality oil could be run as long and perhaps longer between drains than could a high-quality oil under bad conditions.

This discussion could go on and on and would, I suspect, develop into a debate and perhaps an argument as to what is the definition for a high-quality and a low-quality oil and how many grades ranging from excellent to awful bad would fall within those two classifications. Certainly, conventional specifications would not count too much because a solvent-treated oil, made from California's 100 per cent paraffin base or from a California semi-paraffin base, or a California non-waxy crude base that when finished would have a relatively low viscosity index, would actually give better results than would a Pennsylvania or mid-continent conventional-type lubricating oil having a high viscosity index; *but* it would require years of education to get this idea over to the people that actually buy the oil or to the people who control the buying by setting up the specifications on which the oil is to be purchased so in the final analysis, we are forced to ask ourselves the question, "What is quality?"

We are given to understand that the Chevrolet test engine results, make this determination of quality because it separates the *grain* from the *chaff*. But this method is complicated by the specification requirements such as the minimum viscosity indexes on the oils to be tested in the Chevrolet engine. As an example—The minimum viscosity index on "heavy duty" oil—which is classed as a high-quality product, is 85 on Grade 10, 55 on Grade 30, and 75 on Grade 50 and if this isn't a "dog's breakfast," then I don't know anything about oil.

In my opinion, if the Chevrolet test engine results actually classify quality, then the screwy viscosity index minimum control should be completely thrown out and a more uniform—or should I say sensible—control established. This, to me, is Issue No. 1.

The recommendation in Mougey's paper of when to change oils does not take the monkey off the backs of the fleet operator nor the private car operator as to when the oil should be changed or what method should be used to determine when it should be changed.

This subject incidentally has been kicked around for years and today we are in the same fix as of yesteryear, in that, if an operator should send samples of used oil, taken from the same crankcase, to 10 different laboratories and asked the simple question, "Should this oil be changed, or about when should it

Discussion of Mr. Mougey's paper presented at the SAE National Transportation & Maintenance Meeting, Philadelphia, Pa.

HOT SLUDGE

(CONTINUED FROM PAGE 39)

shown in Figs. 1 to 8 inclusive. In all of these tests the engines were thoroughly cleaned at the start of the test. The engines in Figs. 1 to 4, inclusive, were operated on highly refined high viscosity index oils without any added oxidation inhibitors or detergents. Fig. 1 shows an engine from a vehicle operated on straight mineral oil for 6326 miles without draining the crankcase. The badly sludged condition indicates that this is too long between drains for oil of this quality under these operating conditions.

be changed?" he would get back 10 different answers—unless by chance, two or more just happen to coincide. From the fleet operators' viewpoint, this is a bad situation and should not exist.

The purpose of my discussion here is just when will someone have enough guts to propose a chart based upon something that will lead to standardizing or making uniform a method by which when certain analysis are added, divided, or subtracted, they will result in a final figure, which will indicate the range of hours or miles the oil should be run before being changed; and if it is not changed at that period, then the operator will at least understand that he will, in one form or another, pay the penalty for such overruns.

Such a method, in my opinion, will automatically separate high and low-quality, on the basis of miles of useful service between oil changes.

This method would also give the operator a choice of buying oil on a basis of cost per mile or cost per gallon.

While the subject paper is indeed very educational, it is in reality a warning of "Do's and Don't" but the real answer that the operator wants and needs, "When should I change my oil" is simply not there. So we are back again in the same old position, No. 1.

Today, the operator asks the oil representative, "When should I change the oil?" The oil representative then asks his laboratory, which in turn asks the technical department, which in turn asks the sales department, which in turn asks the management—because this is a hot question of policy—and on and on it goes; and no one—and this includes me too—is in a position to give the answer. What a fine kettle of fish for two big industries—the engine builders and the petroleum refiners—to be in. Talk about politics!

Well,—why don't we do something about it?

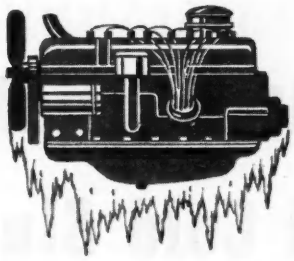
The oil screen shown in Fig. 2 and the piston shown in Fig. 3 are from an engine operated 8418 miles on straight mineral oil without draining.

(Turn to Page 132, Please)

Controlling Cold Engine Sludge

Proper engine operating temperature is surest cure. Good oil, crankcase ventilation, and hot drain and flush also aid

by B. E. SIBLEY
Chief Technologist, Continental Oil Co.



"Good supervision in maintaining healthy or normal engine temperatures, the use of a good quality oil, in combination with effective filters, air cleaners properly serviced, observance of a sane crankcase drain period and the practice of draining the crankcase hot are the major items that can be easily used to advantage in controlling cold sludge problems. The use of 'heavy duty' oils is considered as supplementary only to these items."

Taken from the accompanying article based on a paper presented at the SAE National Transportation & Maintenance meeting, Philadelphia, Pa.

MANY definitions may be advanced in the description of sludge. The type of sludge under discussion will not be misunderstood when we refer to it as low temperature sludge, cold engine sludge, water-type sludge and the typical grease-like sludge that is understood by those who have had practical experience with the sludge problem.

Control

1. Engine operating temperatures should be properly maintained by use of dependable thermostats in the cooling system. Proper supervision to assure having a healthy and normal engine temperature is generally recognized as a necessity in guarding against engine maintenance problems of which sludge is frequently the cause of the trouble.

Adequate crankcase ventilation is required to assist in disposing of trouble with the water vapors. Head gaskets, other gaskets and water connections should be maintained in a non-leaking condition. Careful inspections will produce surprises at the number of "leakers" that can be found.

2. (a) Good oil filters of sufficient capacity, properly serviced, will obviously greatly reduce the amount of sludge-forming contaminants that would otherwise accumulate in the oil system. The location and amount of such accumulations will, of course,

(Turn to Page 134, Please)

Filters vs. Hot And Cold Sludge

What can be expected of present-day filters in connection with the two types of engine sludging problems

by EARL G. GUNN

Vice President in Charge of Engineering, Fram Corporation

Earl G. Gunn

CRANKCASE oil in vehicles off city streets will show effects of considerable oxidation in a few thousand miles. Even though the temperature of the body of the oil may be low on account of the large amount of radiating surface, particle temperature of oil on cylinder walls and pistons, oil forced through bearings and pressure relief valve may be relatively high. Severe oxidation occurs in hydraulic pressure where the oil temperature is never high in the main body of the oil, but where the particle temperature of the oil in various places must be high.

The most apparent effect of oxidation is in the appearance of those oxidation products consisting of resin-like material which normally remain in solution in the oil. This material can be removed partly, at least, by adsorption or precipitation. Tests seem to indicate that if a filter contains any substance active enough to remove resin-like material from solution, it will also remove additives to about the same degree, even from new oil. However, finely divided carbon is present, and in gasoline engines less salts also. These solids can, and do adsorb upwards of 30 per cent of their own weight of resin-like material, which adheres so tightly that it cannot be washed off without hot naphtha.

Clean used oil often contains upwards of three per cent by weight of resin-like matter in solution. Part of this is readily curdled by gasoline. Inasmuch as there is always some dilution, this curdling process is probably continuous. It can be, and it seems reasonable to suppose it should be, filtered out.

Removal of Additives

There is a great deal of loose talk concerning the removal of additives by filters. If finely divided solids are introduced into new oil containing additives, the additives will adhere to the solids just as resins do. If the solids are left in, and dispersed by stirring, an oil analysis will naturally show no additive depletion. This is a fact usually overlooked. Oil samples are commonly analyzed for additive content with the solids left in. It would seem that the oil should first be strained because any additive adhering to a particle of solid material will not leave that particle to do a new job. If it could, soapy water would not lose its cleaning qualities by repeated use. Additives adhered to suspended solids is useless additive.

Cold Engine Sludge

Checks on a large number of vehicles this past winter revealed that the crankcase oil (solids free) often contained two per cent by weight of soluble resins. Thus oxidation is shown to take place to a marked degree even in cold weather. When new oil is added some curdling takes place, also dilution and condensation are, of course, more prevalent in cold weather, and curdling can be expected from these. Appreciable

(Turn to Page 191, Please)

Excerpts from a paper presented at the SAE National Transportation & Maintenance meeting, Philadelphia.

"What Fleetmen Want in Post-War Trucks" was the subject of an S.A.E. paper by Gavin W. Laurie, manager, Automotive Transportation Dept., Atlantic Refining Co., which was published in the February, 1944, issue of Commercial Car Journal. In it Mr. Laurie summarized a variety of improvements desired by fleetmen.

In this article, excerpted from a paper presented at the S.A.E. National Transportation Meeting in Philadelphia, B. B. Bachman, of The Autocar Co., analyzes those wants from the point of view of the manufacturer.

In formulating these observations, Mr. Bachman availed himself of consultation with others on his side of the fence so that the views he expresses are, like those of Mr. Laurie, representative of his group.

The Manufacturer View of Operators' Wants

An engineer analyzes the complaints about cooling systems, electrical equipment, unit replacement and cabs

by B. B. BACHMAN

Vice President in Charge of Engineering, The Autocar Co.

B. B. Bachman

A considerable part of Mr. Laurie's paper was devoted to the cooling system. Water cooling, as generally used in truck engines, has been developed into a fairly reliable and adequate system. With pump circulation, the coolant can be directed to the zones of greatest heat with sufficient velocity to promote efficient heat transfer. The specific heat of water is good as compared with other liquids, the coefficient of expansion is favorable and the conductivity is excellent. The jacketing of the cylinder can be incorporated in a practicable casting and the construction of the radiator and pump and fans has been developed so that efficient and durable structures are available.

On the other side of the ledger, there is the need for a considerable amount of plumbing with a multiplicity of connections which, subjected to movement and strain, develop leaks. Variations in the acidity and solid content of the water cause corrosion, electrolysis and deposition which destroy and decrease the effectiveness of the various parts of the system. Furthermore, the weight which is represented by the radiator, fan, piping, jacketing and water, is a considerable and important percentage of the engine installation. The bearings, particularly with regard to lubrication of the pump and sealing the shaft, have been troublesome. The freezing point is within the range of temperature frequently encountered in normal operating conditions requiring the use of anti-freeze.

The Ideal Cooling System

Ideally, the cooling system should provide for the following:

1. Permit the engine to attain a satisfactory operating temperature as soon as possible.

2. Maintain this temperature with the least practicable variation for all operating conditions.

3. The coolant should be circulated to provide maximum cooling at high heat zones.

4. Dead pockets must be vented to prevent steam trapping.

5. Adequate circulation of coolant must be provided to reduce temperature differentials in radiator and cylinder block.

6. Adequate air flow must be pro-

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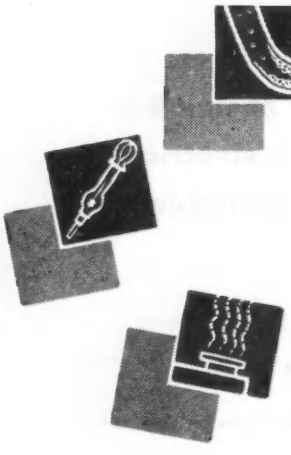
Causes and Cures of Cooling System

Study of 1616 failures indicates regular coolant inspection will anticipate

by DANIEL H. GREEN

Service Manager, Cooling System Products Div., National Carbon Co., Inc.



THE PRACTICAL APPROACH TO COOLING SYSTEM MAINTENANCE

"Generally speaking, preventive cooling system maintenance has never been up to the standard of service for other units of the vehicle."

"There appears to be little justification for overheating difficulty from rust clogging of the cooling system, but this condition continues to exist."

"Prevention of coolant loss and shortage from external leakage can be avoided by the regular practice of leakage inspection and, equally important, by the prompt correction of leakage in the early stages."

"A practical test for internal leakage of the water jacket can be made without any special tools."

"Air suction and combustion gas leakage tests should be made whenever overflow losses cannot be explained, or when the coolant becomes rusty in a comparatively short time."

"Hose failures were primarily related to composition and fabrication and not to type of coolant used."

"We believe the most practical approach to cooling system maintenance is through the medium of coolant inspection—(1) coolant level, (2) coolant temperature and (3) coolant condition."

Taken from the accompanying article based on a paper presented at the SAE National Transportation & Maintenance meeting, Philadelphia, Pa.

THE tabulation (shown herewith) listing principal causes of cooling system failures, and showing their frequency in per cent of the total, was developed from information obtained in 1616 systematic field investigations by a group of 25 cooling system maintenance specialists at widely scattered points over the country during the year ending April 1, 1941. The breakdown of failures in the table follows the pattern of failures investigated during the previous 10 years, and we believe it to be fairly representative of cooling system conditions in general with respect to the relative prevalence of contributing causes.

A large majority of the failures investigated took place during cold weather, and a considerable number were caused by slush-ice restriction in the radiator core resulting from failure to install or maintain adequate anti-freeze protection.

Generally speaking, preventive cooling system maintenance has never been up to the standard of service for other units of the vehicle. Analyses of failures for the year ending April 1, 1941, which, we believe, might be classified as normal, indicate neglect of certain essential items of maintenance directly affecting cooling system operation, indirectly affecting performance as well as cost of operation and maintenance of the powerplant.

Rust Clogging

By referring to the table, it will be seen that clogging of the cooling system caused over 14 per cent of the failures investigated, in spite of the fact that radiator rust clogging can be avoided. For a number of years, all standard anti-freeze products have contained corrosion inhibitors, and,

Troubles

serious trouble

ANALYSIS OF COOLING SYSTEM FAILURES

Number of failures investigated	1616
Passenger vehicles	1485
Commercial and industrial vehicles	131
Number of service engineers reporting	25

Contributing Conditions	Per Cent of Total
Rust clogging	14.3
Corrosion damage	4.0
Thermostat failure	2.4
Combustion gas leakage	12.5
Internal coolant leakage	4.2
Cracked cylinder head or block	3.6
External leakage—	
water jacket joints	4.1
radiator and heater	8.1
water pump shaft	6.2
hose and hose connections	6.6
Insufficient anti-freeze protection	8.7
Inaccurate anti-freeze testers and testing	4.1
Overfilling	3.6
Low coolant level	4.0
Air suction into system	3.9
Thermal surge and pumping over	1.3
Foaming	.7
Air trapped during filling	.5
Miscellaneous	3.5
Undetermined	3.5

for warm weather driving, inexpensive inhibitor preparations are generally available which will retard effectively the corrosive action of water for long periods of use. There appears to be little justification for overheating difficulty from rust clogging of the cooling system, but this condition continues to exist.

Analyses of cooling system deposits show them to be mostly made up of iron rust, water scale and grease, with iron rust comprising over 90 per cent of the bulk. Examination of the water jackets of new vehicles in storage reveals that heat insulating films of rust scale may develop before the vehicle is put into service. Without effective rust prevention during vehicle operation, cooling efficiency is slowly but continuously lost as the rust scale grows thicker in the water jacket, and at the same time loosened and carried into the radiator core by coolant circulation.

An experience with a clogged radiator, followed by overheating and engine failure, teaches a lesson of its own. What we would like to emphasize, is the need for more education on the *prevention* of the progressive rust condition, which retards heat transfer in both water jacket and radiator, bringing about a long period of mild chronic overheating in the hottest areas of the water jacket, *before* the radiator is completely clogged and the final acute phase of overheating takes place.

Preventive Cleaning

For best results, preventive cleaning of cooling system deposits, which build up slowly with high mileage under the best of conditions, should be performed periodically. The need for preventive cleaning can be deter-

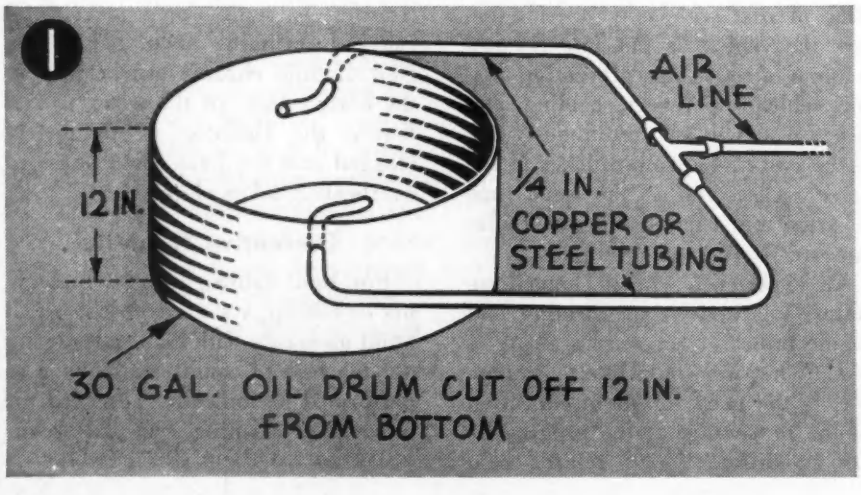
(Turn to Page 102, Please)

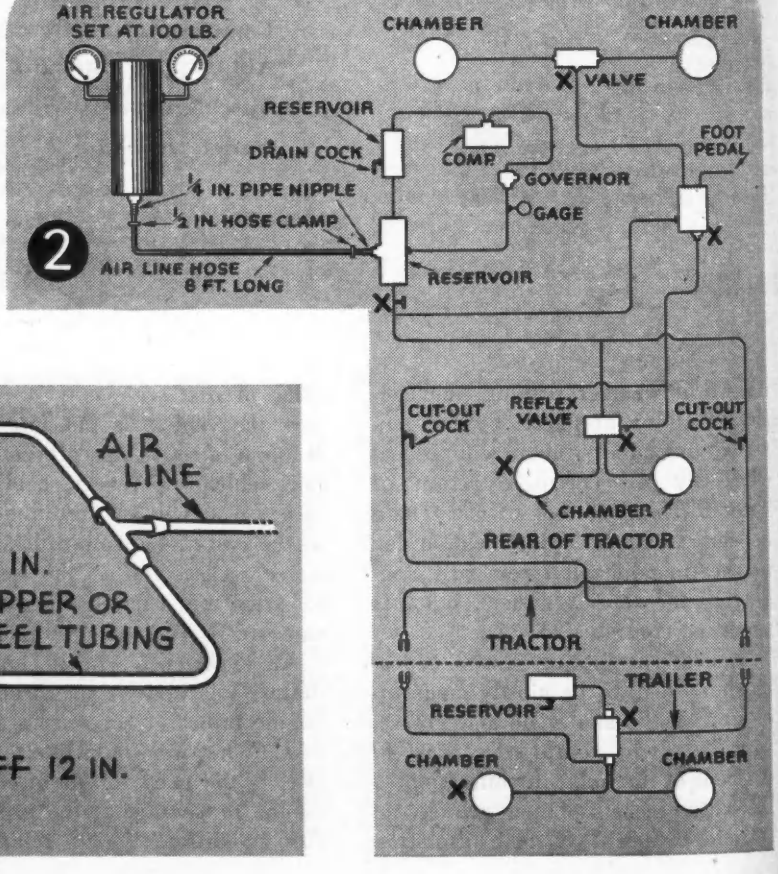
$5 SHOP

Commercial Car Journal will pay $5.00 for acceptable shop hints and $5.00 for unusual parts salvage tips. Send in as many ideas as you have to the editor. Don't underestimate your ideas. Let the editor be the judge. A photograph or a rough sketch and simple explanation in your own words are enough. CCJ will polish them up for publication. Use this opportunity to earn extra money to buy more War Bonds to "Back the Attack."

The Shop & Salvage Hint spotlight this month is turned on nine mechanics for their contribution in keeping essential transportation rolling with skill and ingenuity as well as with mechanical ability:

1. Welding Preheater by John L. Scruggs
2. Air Line Leak Detector by Erwin W. Nagel
3. Engine Accessibility by De Leon Clayton
4. Starter Salvage by T. H. Sompayrac, Jr.
5. Emergency Brake Repair by Budd Shaulis
6. Inner Tube Storage by T. J. Hourihan
7. Tractor Tow Bar by L. E. States
8. Headlight Repair by Budd Shaulis
9. Fender and Body Clamp by G. E. Upperman
10. C.O.E. A-Frame by Claire E. Ellsworth





& SALVAGE HINTS

1. Welding Preheater

by John L. Scruggs
Pacific Motor Trucking Co.,
Eugene, Ore.

I have devised, and now satisfactorily use, a preheater that was very inexpensively constructed.

I took a 30-gal. oil drum, cut it 12 in. from the bottom, and drilled two 5/16-in. holes four in. from the bottom and directly opposite each other. Next, I took two even lengths of copper tubing (steel will do), inserted one end of each into the holes so that they extended inside about six in., then bent them, about four in. from the ends, toward the outside of the drum. It makes no difference in which direction they are bent, clockwise or counterclockwise, as long as both are in the same direction. To the opposite ends of the tubing I fitted a T-connection, one end of which was attached to an air line.

This is how the preheater is operated: Place cross bars of any description on the bottom to support the casting. Pour a half gallon of gasoline into the drum and place casting on cross bars. To ignite gasoline, light a small piece of paper and toss into drum. Next, open air valve slowly and gradually. As the air enters the drum, with a spiral motion, it will create a regular blast furnace.

The amount of air and gasoline required for a preheating job will depend upon the size of the casting. For example, a half gallon of gasoline will burn approximately four minutes, using 50 lb. pressure. This is the time required to heat an SAE No. 2 flywheel housing (such as used on a AA600 diesel) and allow about five minutes of brazing. The operation is repeated as often as required until the job is finished.

Since caution should be exercised when using gasoline in all types of furnaces, I have found this method to be as safe as any.

2. Air Line Leak Detector

by Erwin W. Nagel
International Harvester Co.,
Allentown, Pa.

We had a truck in for repairs that had a damaged engine and leaks in the air lines. Since the engine could not be run, and there wasn't enough air in the reservoir, I used the following procedure to check the air lines so that both jobs could be done at the same time.

I took an old paint spraying regulator outfit that could be set from 10 to 150 lb. Then I took an eight-ft. length of standard air line hose and put a quarter-inch pipe nipple on the regulator and one on the reservoir drain plug side, after first removing the drain plug. The hook-up is shown by the accompanying diagram.

I filled the air system, checked for leaks (shown by X on the diagram), and made all repairs, including the relay valve, in 65 minutes.

To check diaphragms, use a pedal jack or block the foot pedal. The air delivered through the regulator is always at a steady pressure, and the pressure shows up on the dash gage while making the tests. Also, there are no engine noises or gas fumes to contend with.

Trailer can be tested by applying hand control or foot pedal. The above procedure works out very well on all brake jobs, semi or full air.

3. Engine Accessibility

by De Leon Clayton
Continental Baking Co.,
San Diego, Cal.

Often, it takes longer to get to a part than to repair or replace it. On Ford trucks having bolted side panels, I worked up an idea that has been a great time saver.

I removed all nuts and bolts, shown by X on my sketch, and the wing nuts, marked by Y. Then I drilled a 3/16-in. hole in the panel

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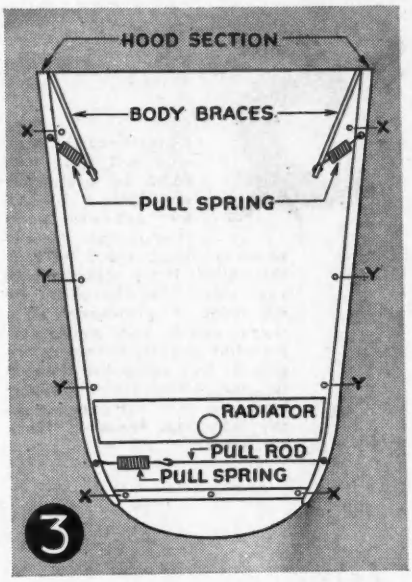
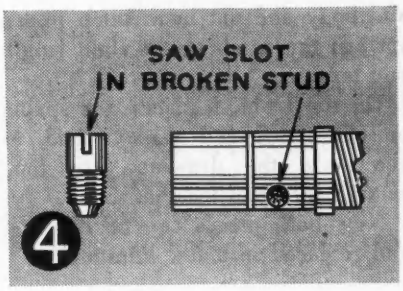
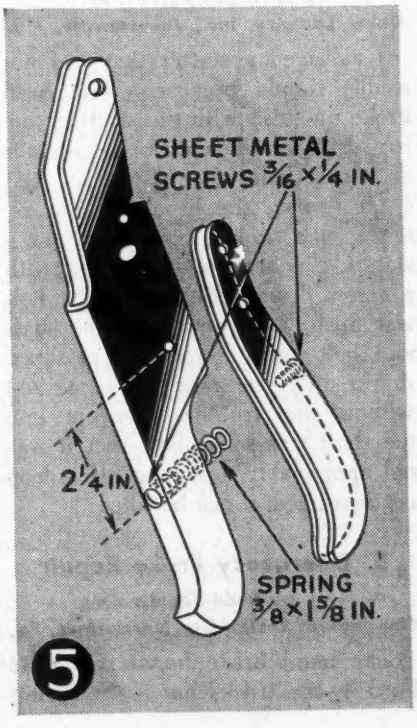
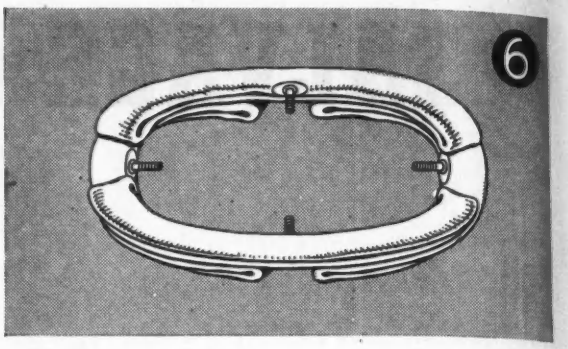






SHOP & SALVAGE HINTS

(CONTINUED FROM PAGE 47)



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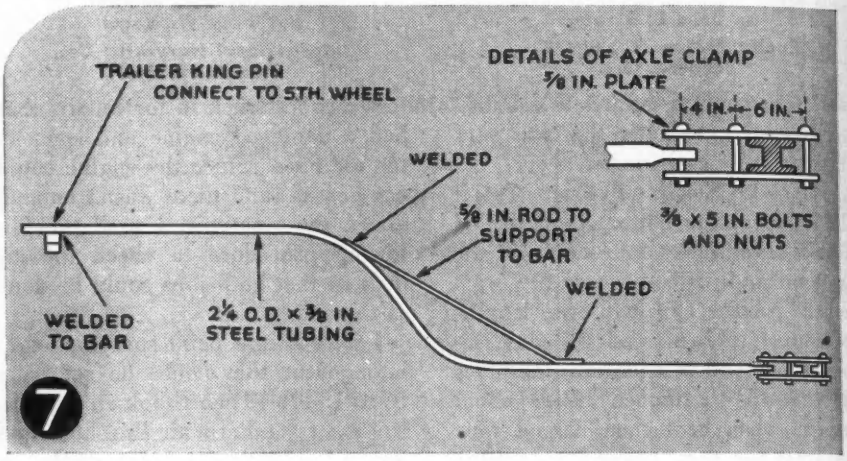


and body and put in a clutch return spring; this is about the right length and tension.

On the front, I installed a spring on one panel and made a rod, as shown in the drawing, just long enough for good tension.

Now both panels can be removed and replaced in a few minutes.

4. Starter Salvage

by T. H. Sompayrac, Jr.
Duval Laundry, Inc., Jacksonville, Fla.

I salvaged a starter that was not usable simply because a bolt head broke off flush with the starting motor drive shaft and locked to the armature shaft.

Of course, the usual way to remove such broken bolts is to cut a slot in the head and turn out with a screw driver. But, since the bolt was flush, I cut into both the shaft and bolt until I could get a screw driver into the bolt. It came out without any trouble. The cut into the shaft was so shallow that it was not appreciably weakened. If a deep cut is needed, it can be filled.

5. Emergency Brake Repair

by Budd Shaulis
Continental Baking Co., Norristown, Pa.

The hand brake handle on 1937 Ford ½-ton trucks has a flat spring that keeps the dog in the ratchet. We couldn't get a new spring, so I made the following repair.

I punched a hole through each of the handles, 2¼ in. from the center of the rivet that holds the parts together, to take a short, 3/16-in. sheet metal screw. Next, I took a spring that measured ⅜ in. in diameter and 1⅝ in. in length, compressed it and wired it tight so that it would stay compressed. Then I slipped it in between the handle parts and cut the wire so that it expanded between the two screws. The handle worked like new.

When making the holes, they should be punched so that the underside is raised to keep the spring in position.

6. Inner Tube Storage

by T. J. Hourihan
Moulton & Holmes, Roxbury, Mass.

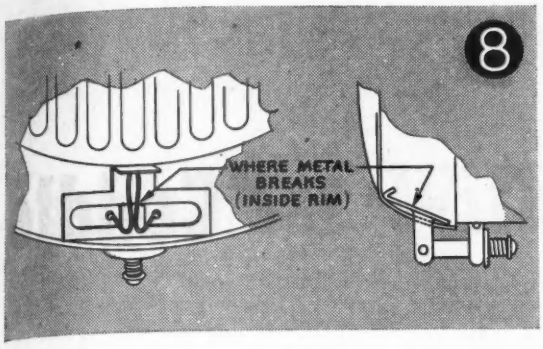
I have found a way of storing inner tubes that requires very little space, keeps them neatly stacked and in excellent condition and has resulted in all-around efficiency.

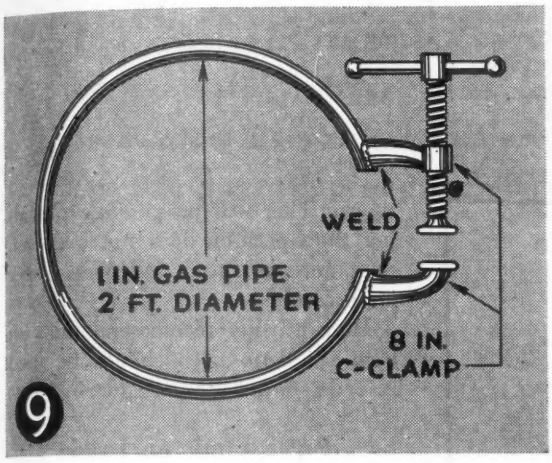
After repairing leaks, I place the tubes flat on the floor and remove the valve insides. I take a hose and attach it to the booster brake hose of one of our tractors, which completely deflates each tube as flat as a pancake. After removing the hose, I cap each valve stem with an ordinary valve cap to keep the tube flat.

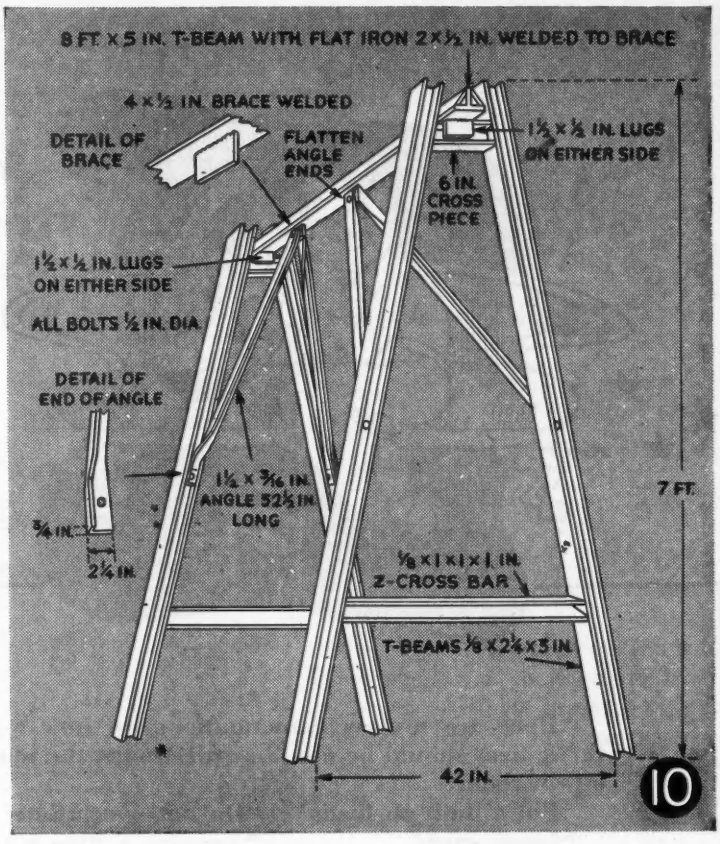
After all tubes to be stored are deflated, I fold them in half at a right angle to the valve stem, so that it is located in the center. Next, I stack them so that two folded tubes make a complete circle. Upon these I place two more similarly folded tubes, but so that the valve stems are at right angles to the bottom tubes, as shown by the accompanying sketch.

This method permits the storing of many tubes in a small space. Actually, four to six tubes can be stored in the space previously occupied by one. Not only that, but they do not fall all over the place, as they usually do, when one or more are removed for use.

If it is not possible or convenient to make a connection with the booster brake, as described above, attach hose to plug or connection on intake manifold of any engine.






8 FT. x 5 IN. T-BEAM WITH FLAT IRON 2 x ½ IN. WELDED TO BRACE
4 x ½ IN. BRACE WELDED
DETAIL OF BRACE
FLATTEN ANGLE ENDS
1½ x ½ IN. LUGS ON EITHER SIDE
6 IN. CROSS PIECE
1½ x ½ IN. LUGS ON EITHER SIDE
ALL BOLTS ½ IN. DIA.
DETAIL OF END OF ANGLE
1¼ x 3/16 IN. ANGLE 52½ IN. LONG
¾ IN.
2¼ IN.
7 FT.
⅛ x 1 x 1 x 1 IN. Z-CROSS BAR
T-BEAMS ⅛ x 2¼ x 3 IN.
42 IN.
10

7. Tractor Tow Bar

by L. E. States
Scott Bros., Inc., Philadelphia, Pa.

We designed and constructed a tow bar that is being used successfully by our tractors. It doesn't take much in the way of time or material, and it is convenient and safe.

We took a 10-ft. length of steel tubing, 2¼ in. O.D. and 1½ in. I.D., and bent it as shown by the sketch. To one end we welded a semi-trailer king pin to hook up to a tractor fifth wheel, and to the other end we bolted a home-made clamp, large enough to fit over the front axle of any of our trucks or tractors.

The bend starts 3 ft. 10 in. from the front end of the tow bar and drops down 22 in. at a 45-deg. angle. It is reinforced by a suitable length of ⅝-in. rod, welded at each end. The clamp is made of ⅝-in. steel plates, held together by ¾ x 5 in. bolts, spaced as shown by the sketch.

8. Headlight Repair

by Budd Shaulis
Continental Baking Co., Norristown, Pa.

When the little clip held by the spring on the headlight door of Ford trucks, from models AA to 1940, breaks we make a quick repair with a paper clip.

The break usually occurs on one side of the ear that is riveted on the pin, as shown by the sketch. First, we bend the clip back to its original position. Then we bend a paper clip, or a wire of the same thickness, raise the little plate on the inside of the door, push the end of the paper clip under the original clip, push the two short ends through the two small holes in the door and bend them over. It only takes a few minutes, and the result is very satisfactory.

9. Fender and Body Clamp

by G. E. Upperman
Continental Baking Co.
Wheeling, W. Va.

We have a C-clamp which we find very useful for fender and body repairs that we made from an old eight-in. clamp. This was made by sawing off the ends of the small clamp and welding them to a piece of one-in. gas pipe that was bent in the shape of a circle two ft. in diameter. For some jobs, it may be more desirable to bend the pipe in an oval shape.

10. C.O.E. A-Frame

by Claire E. Ellsworth
Ellsworth Sales Co., Eagle Grove, Iowa

We have simplified and speeded up the removal of engines from our c.o.e. jobs by two pieces of home-made equipment that certainly proved profitable to make.

One of these is the hoist stand, or A-frame, shown in the accompanying snapshot. This has a cross beam which can be easily removed by pulling two bolts that hold the center angle braces to the beam. It is placed through the cab and easily reassembled to provide firm support for a 1-ton chain hoist. Details and dimensions of this hoist stand are shown in the sketch, Fig. 10.

The other piece of home-made equipment is an engine dolly which we made from the Shop Hint submitted by W. M. Love for a dual wheel remover, published in the July, 1943, issue of COMMERCIAL CAR JOURNAL.

Our procedure for removing an engine with this equipment is to lower the engine on the dolly, raise the front end of the truck, and roll the engine out.

Coddle Sy

"Here are my recommendations on how synthetic tires should be used in order to get the most out of them:

"Put a limit on loads
"Limit speed
"Check tire pressures
"Do not overinflate
"Appoint a 'tire man'
"Retread at the proper time"

"In addition to the above, it goes without comment that all the commonplace preventive maintenance procedures should be observed."

"We find that the rate of tread wear with synthetics is affected by the seasons."

"There are no special precautions needed in retreading with synthetic except that the splice has to be a rubber gum strip to make sure that the splice will not open up."

Taken from the accompanying article, which is based on a paper presented at the SAE National Transportation & Maintenance meeting, Philadelphia, Pa.

FLEET owners and operators should be realistic about the existing tire situation and accept the following facts:

1. The tires we are making and going to make—at least up to the time of the recovery of the Far East plantations—are, for the present, 50 per cent synthetic and, eventually, will have to be made almost entirely of synthetic.

2. The present facilities of processing rubber are inadequate to make all the tires that are going to be needed, at least for the time being.

3. Synthetic tires, if operated within their known limitations, will do a pretty good job.

4. Synthetic tires will go out of service due to premature failures under overload, overspeed and improper inflation conditions which are not too troublesome to tires made of natural rubber.

It is essential to provide preventive maintenance designed to favor and coddle the synthetic tires. The ideal treatment of these tires would be to use them in such a manner that they could be retreaded two, three or four times. This will be possible providing the operator does not overload, does not overspeed and uses proper air pressures.

Here are my recommendations on how synthetic tires should be used in order to get the most out of them:

Put a Limit on Loads

Inform yourself as to the maximum load per tire set up by the Tire and Rim Assn. tables; see that no synthetic tire carries a load any heavier. You have to be conscious of figuring the load on each individual tire; averaging loads on the whole truck or one end of truck will not do. See that the payload is properly distributed in the body of your truck and semi-trailer. We can't even agree to the 20 per cent overload set up by the ODT some time ago. Overloading the tires will make them flex more, which will develop heat. This, in turn, may result in tread or ply separation and premature body failures, either from flex breaks or impact breaks. In addition heat build-up will make your synthetic tubes go flabby. If these things happen, then you can't save the body of the tire for retreading. If you feel that you must carry more load, put on larger size tires.

Limit Speed

The higher the speed, the higher the temperature builds up in the casing with the same general results as mentioned under overloads. High sustained speed is particularly bad. Short bursts of speed of a mile or two with intervals of slower speed or stops for cooling down are not too troublesome.

Synthetics With Genuine Tire PM

Tire engineer outlines known limitations of synthetic rubber tires and tubes and translates them into maximum mileage by a specific operation and maintenance program

by JAMES E. HALE
Manager Development Department, The Firestone Tire & Rubber Co.

The objective should be to limit the average cruising speed. This is so important that I think the truck and bus industries should program on a new basis of recognizing in cold weather they can run at certain speeds; in moderate weather they will have to reduce the speeds; and in hot weather they will have to reduce the speeds still further.

I wish I could make some definite recommendations but this is not possible until we get considerable background in actual experience due to infinitely varying conditions. As a means of conveying the general character of what I have in mind, however, I am setting down some suggested tentative figures in the following tabulation as a means of presenting a new thought for serious consideration:

SUGGESTED APPROXIMATE SPEED LIMITS FOR COLD—MODERATE—HOT WEATHER

Atmospheric Temperature	Average Cruising Speeds	Max. Speed for Short Distances
Under 40 deg. Fahr.....	40 m.p.h.	50 m.p.h.
40 to 80 deg. Fahr.....	35 m.p.h.	45 m.p.h.
Over 80 deg. Fahr.....	30 m.p.h.	40 m.p.h.

I realize this is a disconcerting recommendation, to say the least, but you just can't afford not to program on such a basis if you want to preserve the bodies of your tires for retreading.

Check Tire Pressures

Use only the Tire & Rim Assn. recommended pressure and this means the pressure as observed in the cold tire. Pressures should be checked often enough to know that the proper pressure is in the tire. Ordinarily twice a week is sufficient. Do not under any circumstances "bleed" the pressure down where it has gone up due to heat affecting the tire.

Underinflation is particularly bad because the tire flexes more and builds up heat in a way to bring about troubles resulting from heat and high temperature.

Especially do we caution against running synthetic tires flat even for any distance at all because it has been found that such a practice loosens the cords on the inside plies to such an extent that the casings have to be scrapped.

Do Not Overinflate

I particularly caution against this, although it is quite a common practice, the belief being that it is all right to overload the tires if the pressure is correspondingly increased. It is true that higher inflation limits the deflection but when a tire is overinflated, the cords are under a higher degree of tension and, consequently, are much more likely to fail from impact breaks. This is especially true in the case of synthetics due to the stiffer nature of the stock.

With over-inflation there is much greater likelihood of tread cracks, which in the case of synthetics are accentuated. With overinflation, too, intensity of pressure on the tread is localized with greater chances of tread separation. Also, there is greater possibility of premature bead failures.

Appoint a "Tire Man"

This "tire man" should have a tire background, and it should be his job to constantly check inflation, loading, and do everything possible to see that synthetic tires are given a "break." With the proper backing from his superiors he can make a real showing in preventive maintenance on tires.

A system of tire records should be set up and the garage superintendent should take an interest in the handling of the tires. Each vehicle in the fleet should be subject to a "tire load analysis" after which a record should be made of the load limit and distribution of load on the body.

If, in spite of the "tire man's best efforts, premature failures such as separation, body failures and cracking develop, then a qualified tire company representative should be called in immediately for consultation and by this procedure probably result in enabling the operator to take

(Turn to Page 180, Please)

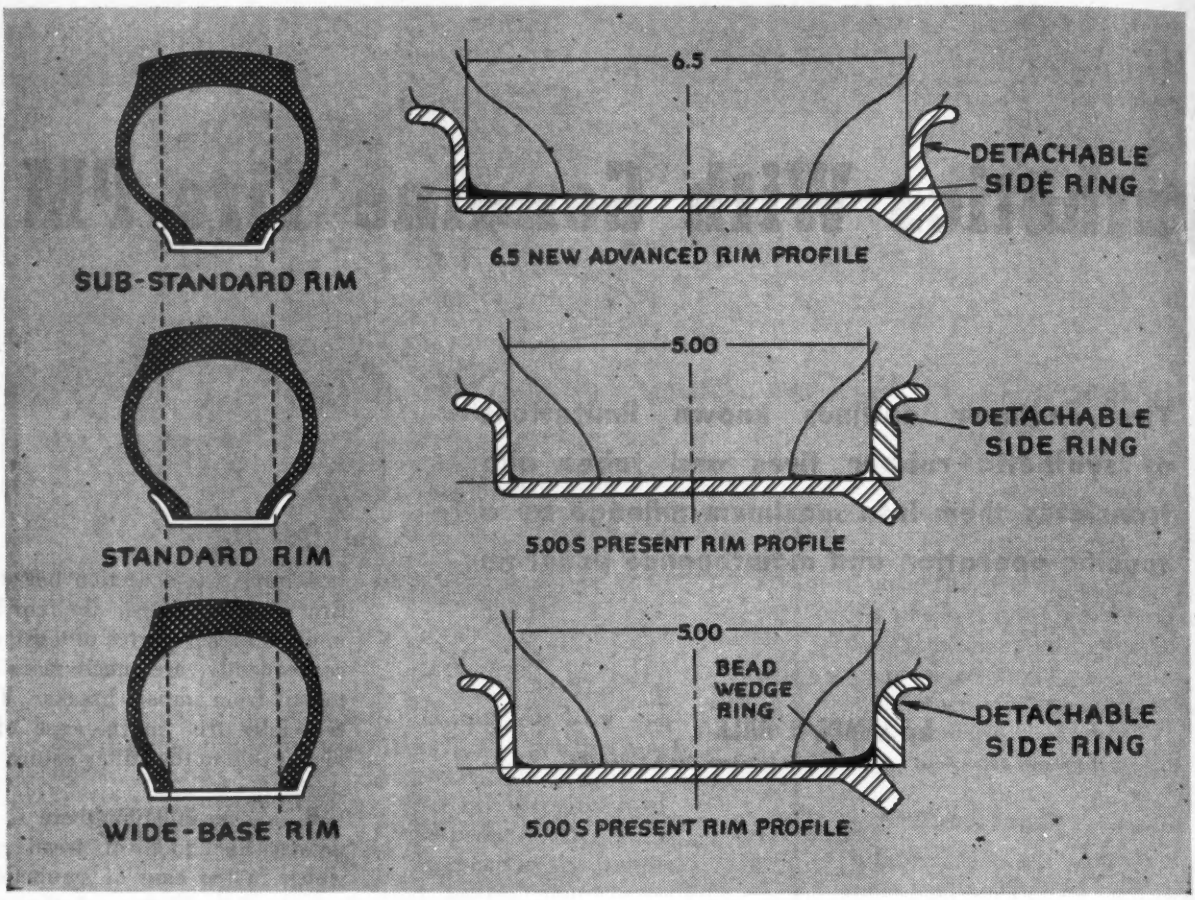


Fig. 1, left above—Sketches show how sub-standard rims pinch tires at beads causing premature failure and how wide-base rim improves this condition. Fig. 2, above—Showing advanced rim with raised seat for bead support on both sides, and present type rim with and without bead wedge ring on one side of flange.

Rim Maintenance Adds Miles

DO RIGHT BY RIMS TO PROLONG TIRE LIFE

"Operators should make it a point to have their rim equipment inspected, and replacements made of any material that is corroded to the point that the surfares supporting the tire are in a roughened condition."

"Care must be exercised by operators to see that their maintenance men use the proper materials if a coating is put on the rim. The use of oil or greasy lubricants is discouraged, as those substances have a bad effect on the life of rubber in the tire."

"It will be noted that the deterioration of the tire and flap is less when the rims are in a clean condition."

"It also will be noted that when a bead wedge is used there is a reduced amount of moisture getting in between the tire bead and the rim."

". . . all operators should have a schedule for inspecting and reconditioning their rim equipment, if they wish to maintain their vehicles on a basis of safe operation and favor the tires in every way possible."

Taken from the accompanying articles based on a prepared discussion presented at the S.A.E. National Transportation & Maintenance meeting.

THERE are many pieces of equipment in service on which the rim equipment is in improper condition for best results for the tires. These conditions consist of, first, inadequate rim size for the tire. Although the general practice of over-sizing tires on rims has been diminishing, there are still some vehicles operating on oversized combinations.

During the past several years there has been a tendency of operators to go to wider than the prescribed rim with an improvement in tire mileage resulting from this practice. Although the next larger size rim may not be considered the optimum fit for the tire, because of the flange height condition, the increased rim width has proved to be helpful. I refer to

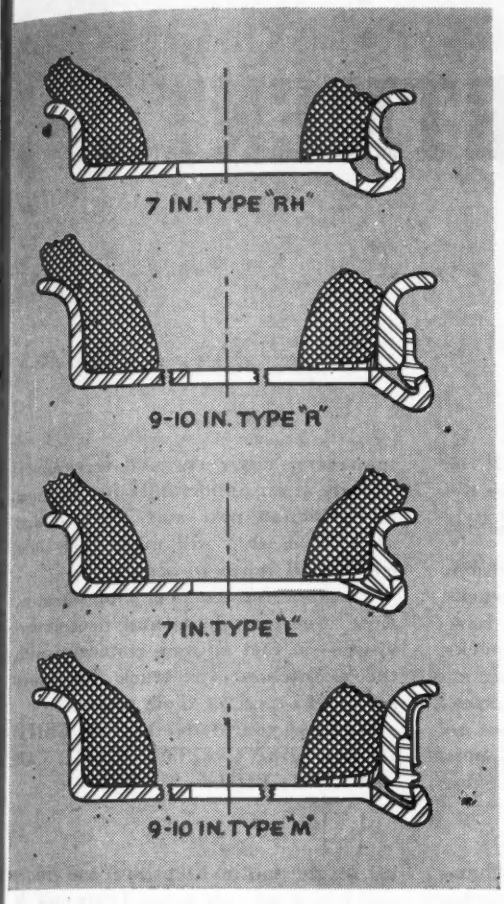


Fig. 3—Showing how wedge ring is applied to removable flange side of four different truck rims in common use to provide bead support

SIX-POINT GUIDE FOR PROPER RIM MAINTENANCE

1. Are rims that are being used of adequate size? The next larger size rim may provide better tire life.

2. Are rims and flanges smooth and free from pits? Are sections reduced by corrosion so structure may be impaired and unsafe?

3. If there is evidence of bead chafing, the use of bead wedges should improve conditions.

4. When tires are changed, are rims and flanges properly cleaned and painted before reassembling?

5. Rims that have been mutilated because of excessive impact or running with flat tire may cause premature tire failure. If flanges have dents and cannot be reformed to proper contour, the rims should be replaced. When such replacement is made check should be made to determine if proper size rim is being used or if a wider rim can be applied.

6. There are quite a few assemblies running with removable side flanges of one make or size of rim on rim or another make or size. This can and does cause tire failure. From an appearance standpoint this may not be noticed by operator but can be detected by a service station or rim distributor who has means for checking these parts for proper contour and size. This may appear to require a lot of attention. However, when a routine is established for checking the points covered it will be found that all of these points can be checked during tire changing operation with no time or expense for this inspection. Replacement of defective material will pay dividends in increased tire mileage.

s to Tires

this flange height condition because in a study which has been made by the Tire and Rim Assn. of the optimum rim, based on our latest experience, the rim width percentage to tire section has been set at 70 per cent, and flanges will be changed to conform to best thinking of tire development men.

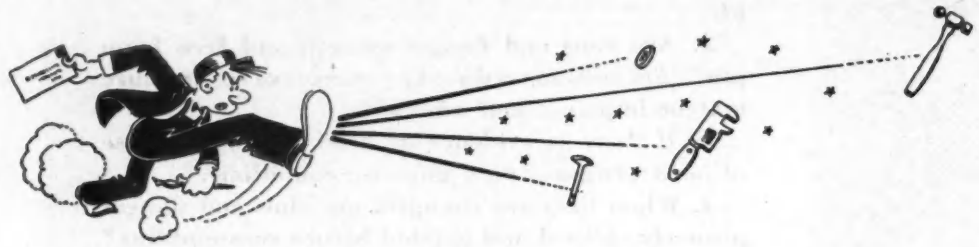
Second, the thinking on rim design for future use establishes this rim width to tire width ratio with flanges designed to provide the desired fit on the tire bead. Furthermore, these rims will have a raised seat for providing radial support for the bead. Most truck rims in general use already have some raised condition on one side.

The advanced thinking is that (Turn to Page 168, Please)

Premature tire failures caused by rusted, damaged or improper size rims can be prevented by periodic inspections and maintenance based on sound, six-point program

by W. S. BRINK
Development Engineer, Firestone Steel Products Co.

THE GRIPE DEPARTMENT . . .



"The Gripe Department," started at the suggestion of a fleetman, invites fleet mechanics and all others connected with fleet maintenance and fleet operation to send in their gripes. It will pay to gripe. For every griping letter published in this department, COMMERCIAL CAR JOURNAL will pay $10. In addition, the best letter each month will receive a $25 War Bond. The choice of letters for publication and for the War Bond will be made by the Editors of COMMERCIAL CAR JOURNAL. Their disposition of letters will be final. Choice will be determined by the content of the letters and not by style of writing or appearance.

Here is a chance for every fleetman to tell the designers of post-war trucks what is wrong with trucks as they have been built and how post-war trucks should be designed to cut down maintenance time and maintenance costs.

Here is every fleetman's chance to get his ideas over to all of the big shots in the truck industry: presidents, sales managers, engineers and servicemen.

Here is an opportunity for fleetmen to influence post-war truck design along lines that will make their jobs easier and more pleasant.

Fleet mechanics, fleet shop foremen, fleet superintendents and fleet supervisors—in fact all men connected with the maintenance of truck fleets—are invited to send in their gripes.

Address your letter to THE GRIPE DEPARTMENT, COMMERCIAL CAR JOURNAL, PHILA. 39, PA.

Griping Pete Lets Go

$10 AND $25 BOND

THE GRIPE DEPARTMENT,
DEAR SIRS:

I am known around our Gulf Fleet Maintenance Shop as "Griping Pete." I have been in this same shop 30 years; lost all the hair on my head and almost all my religion griping about the way the designers build these trucks. In fact, I spend a lot of my time improving things on trucks that the manufacturer should have done in the first place for the benefit of the mechanics who are, today, keeping this equipment rolling under very hard conditions to win this war. (I will incorporate a few examples a little farther on.) But at this part of my writing I want to say that every 10 mechanics old St. Peter has called, nine of them have gone to hell trying to fix something you can't get to.

If any circus needs any clowns all they have to do is get some mechanics. They are trained for the stunts.

Now, all manufacturers when putting out a new truck as a rule have a book of maintenance and inspection periods to be checked every so many thousand miles, and this is very important. But how can you adjust valves when you can't even find the valve cover where the valves are on some trucks? If you do, you have to pull off a wheel, part of the fender, carburetor and lots more. The results are the valves are not being adjusted and the valves are burnt out.

And try to change the fan belts on some trucks! You have to have a cutting torch, pinch bar and chisel before you find the belt.

And the timer, 'way down in a hole near the front spring! If you can stand on your head, this little gadget should be checked very often for new points. And they put a little thing inside the timer they call a condenser. If they would put this inside the muffler, it would be handier. The result is it takes too long to check this every so often and it goes on waiting for a road call. Put a foot longer shaft on this timer and make it handier.

We have one truck in which the designer must have put the carburetor on the motor then built the frame and overhead cab around this unit. It takes 8 hr. to take off and put back on. It should be a 2 hr. job—if these well-paid engineers would do some thinking when these jobs are built.

And here is a little fuel pump, 'way down in a hole that should be cleaned once in a while, if we can. A lot of time, they are. Well, anyhow, we don't need fuel pumps on any trucks to pump gas from tank to carburetor. Here's one for the boys to work on for post-war trucks. I may have the answer.

Oh, yes, I almost forgot—you are supposed to put water in the battery every week. I wonder where you will find it?—under the hood, under the seat or under a fender all full of mud? Put the battery on the running board, so it will be checked.

Well, I could gripe here and write 50 pages but I'll sign off now and have some more the next time. Here's hoping the engineers who sit and draw these trucks on paper will give some thought to the mechanic who, after all, is the backbone of the product once it hits the road. Also the operator will make more money if repairs are simplified.

ARTHUR E. PETERSON,
Mechanic, Gulf Refining Co.,
Louisville, Ky.

For Mechanics, Foremen, Superintendents, Supervisors—in fact all connected with the maintenance and operation of fleets, who want designers to give more thought to making post-war trucks easier to maintain and repair and less costly to run

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WAR BOND

READ **Fleetman Dudley's letter in the June issue, page 40, the letters on pages 48 and 49 of the July issue, and the letters on this page and you'll get a clear idea of what it's all about.**

THEN **pull out a sheet of paper and for gripe's sake gripe and get paid for doing it!**

C.O.E. Difficulties

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THE GRIPE DEPARTMENT,
DEAR SIRS:

We mechanics will admit that the engineers have done a wonderful job in streamlining our modern trucks, buses and cars, but the assembling of these at the factory and the maintenance of them, once they are in service, are two different things. There are many repairs to be made during the life of this equipment, and more thought and consideration given to the accessibility of these repairs certainly would be appreciated by the fleet owner—to say nothing about the disposition of the mechanics involved in this work.

For example, we have several cab-over trucks of a popular make in which the motor is about the most inaccessible thing that I ever saw. To oil the generator, check the fan belt or radiator connections, it is necessary to take out 10 cap screws and remove the radiator grille.

An inspection hole about 6 in. square is provided in the floor board for checking oil in the motor. However, if there is any work to be done, it is necessary to remove 18 screws from the floor board, even to change a spark plug. We have altered the board by installing hinges on one side and using metal buttons to hold the floor board down when the truck is working.

Another gripe is the replacement of the quadrant and pall on the emergency brake (cab-over) which takes at least 2 hr. owing to the inaccessibility. We have shortened the time to one-third hour by cutting an oval-shaped hole through the inside of the front fender, thereby gaining access to the lower part of the brake and also have made a sheet metal cover for this hole using two sheet metal screws to hold same in place.

I could go on mentioning dozens of instances where we have made both major and minor alterations on various pieces of equipment in order to make the repairs more accessible and speed up the work at a time when the equipment must be kept rolling. Most of these alterations would not have been necessary had the engineers at the factory given accessibility for maintenance more consideration.

TOM BROWDISH,
Shop Foreman, State of Washington, Department of Highways, Tacoma, Wash.

V-Pulley Pitch

$10

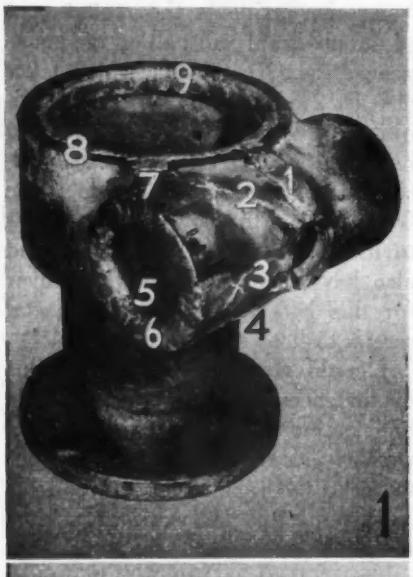
THE GRIPE DEPARTMENT,
DEAR SIRS:

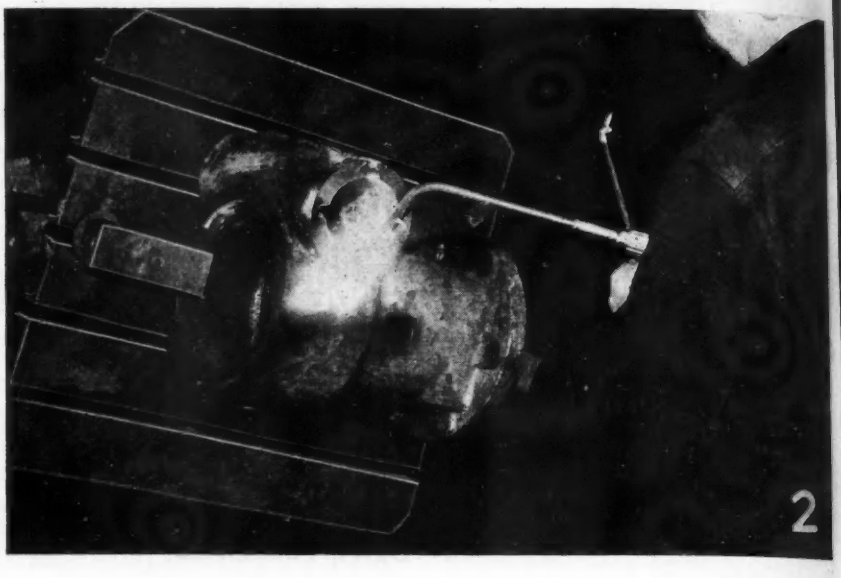
To Mr. C. F. Hawe's article on "What Mechanics Want in Post-War Trucks," I say amen to all the mentioned maintenance inaccessibilities.

As an automotive mechanic of 33 years' experience, I really believe that maintenance is getting more expensive with each new model. The tool manufacturers can't keep up with the vehicle designers and the mechanic is continually buying the specially designed tools.

I have numerous pet peeves and gripes. Most of them have been mentioned or will be, I hope. But the one gripe I am afraid might be overlooked is V-pulleys. Standardize the pitch of degrees and widths into about four pitches and widths. Then maybe the belt manufacturers can design their products so they will interchange. All of their belts will not interchange, as their guide books say, because the pitch is more or less than the original, which makes the belt too short or long for the installation.

ARTHUR M. RHODES,
Master Mechanic, Department of Highways, State of Washington, Olympia, Wash.





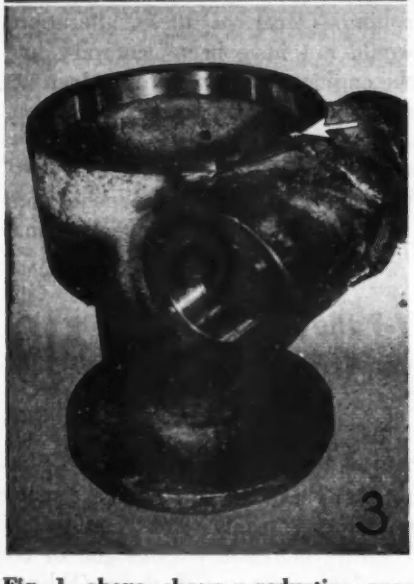
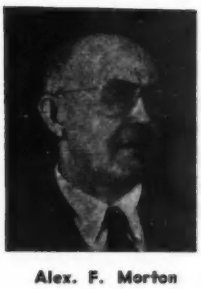


Fig. 1, above, shows a reduction gear housing that just received nine welds, indicated by the numbers. Fig. 2, at right, shows turntable which simplified handling the job. Fig. 3, the finished housing.

Welding Turntable



Alex. F. Morton

DOING A FAST JOB FASTER

Alex. F. Morton's previous articles on low temperature, surface heat bronze welding have dealt with the principles and technique of the process, with special emphasis on the considerable time that can be saved, compared with the customary method of making such repairs.

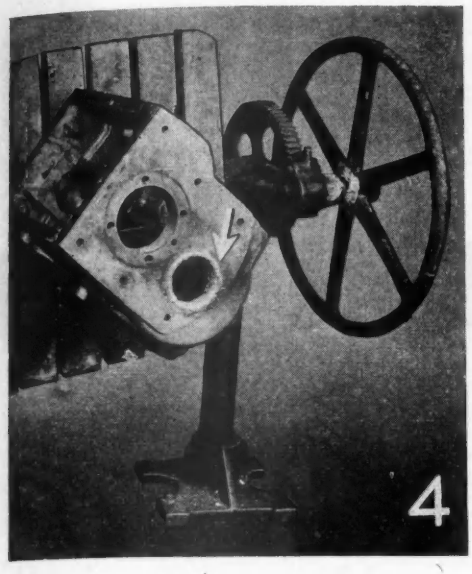
Because manpower and parts shortages have focused attention on time-saving maintenance methods, this month the author proceeds to show how still more time can be saved on welding jobs, especially those awkward repairs requiring the handling of several pieces that must be properly positioned.

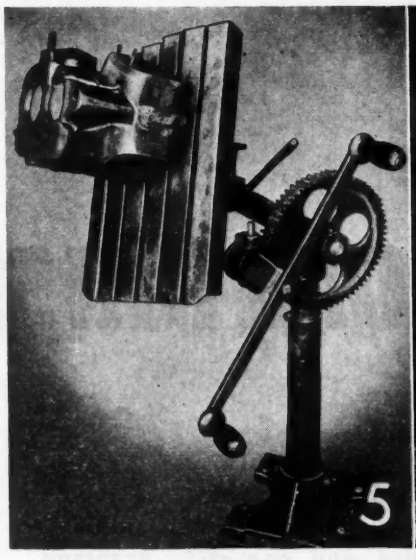
As demonstrated in the two articles which appeared in the June and July issues of COMMERCIAL CAR JOURNAL, the time required for low temperature, surface heat bronze welding of broken cast iron parts is considerably less than that required when welding in the usual way with a cast iron filler rod. The dump truck reduction gear housing, showing in Fig. 1, is another good example. There are nine visible welds, with five on the inside of the housing to balance the opposite, or outside, welds. During peacetime, this part unhesitatingly would go into the junk pile, but by using bronze it was completely welded in less time than would have been used in pre- and post-heating alone.

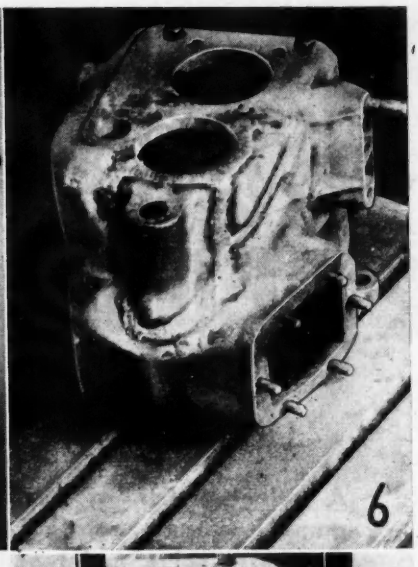
However, considering the need for fast as well as reliable repair methods in these war days and the manpower and parts shortages, it might be well to point out how, by means of a simple device, certain welding jobs can be further speeded, welders turn out more and better work in less time, and crippled trucks released sooner for their much-needed service.

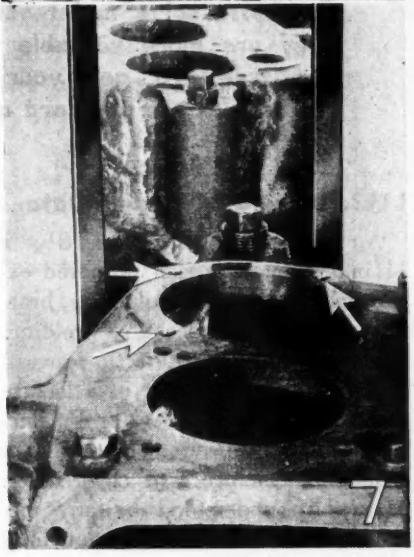
Actually, this device should be considered more in the nature of a tool or essential shop fixture. A machinist would not finish work, such as the reduction gear housing shown in Fig. 1, for example, without proper chucks, tool holders, etc. Yet, in most shops, a welder is handed a job, often in many pieces, and all considerations as to how it should be accurately aligned, positioned and supported before starting on the actual welding operation is left entirely to him. Usually, he has nothing more than a bench and a few blocks and wedges. He places and braces the parts so that he can make a few tacks, or part of a weld, then must stop, shut off the flame, reposition, reblock, relight and reheat before proceeding with the repair.

The time consumed in this blocking up, lighting and relighting the torch with the loss of heat in the casing, which must be made up when the welder relights the torch, is considerable. Moreover, these delays increase the cost of the repair, both in welder's time and gas consumed. In









Eliminates Block-Ups

Home-made device expedites bronze welding of reduction gear and transmission housings. Low temperature iron weld on clutch pressure plate also demonstrated

Fig. 4. Full view of turntable. Fig. 5. Another turntable, same except handle. Transmission case shown would have had to be blocked-up at least 50 times without turntable. Figs. 6 and 7 show how case was finished.

by ALEX. F. MORTON

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the final analysis, it is usually the cost of the repair that either gets the job done or lands the part in the junk pile.

In this respect, we have found it to our advantage to construct, from an obsolete type of motor overhaul stand, a welder's turntable such as shown in Fig. 2. This time-saving device makes possible the reduced cost and increased speed of repair parts broken as badly as the one illustrated in Fig. 1, as the following description of how the repair was made will show.

The several broken parts were chipped one-third through on the outer surface, then, with a pipe plug in the threaded hole, the parts were tacked together, strapped to the turntable and welded in one continuous operation. No time was lost by blocking up for the next position, no gas wasted by putting out the torch to make the shift to the next position, and no gas and oxygen lost by making up the lost heat which occurred during the blocking up operation. The weld was one complete operation except for the small section under the strap which was finished on the bench.

Fig. 3 shows the housing finished except for the drilling and tapping of four new holes in a new location other than those holes shown filled with bronze. One hole, shown by the arrow, had enough cast iron removed from its area so that the new hole was in solid bronze, keeping the drilling and tapping outside the cast iron zone, which saves tools and the machinist's temper.

Fig. 4 shows a better view of the

(Turn to Page 82, Please)

FREE PUBLICATIONS

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VALUABLE AIDS FOR FLEETMEN

A selected list of the latest literature — books, pamphlets and catalogs — intended to help fleet operators solve maintenance and operating problems. They are more valuable today than ever before. All are free. To get your copies simply fill in the numbers on the postcard and mail. No stamp is needed.

L193. Brazing & Welding Data

An interesting four-page, 8½ x 11 in., folder has been prepared explaining the theory of soldering, brazing and low temperature welding. Also covered is the Eutectic process.

The data is a reprint of a lecture given before the recent War Production Clinic in Chicago. The treatment is such that the processes covered can be readily understood by any mechanic, whether he knows something about any of the processes or not.

There are a number of hints that can be used not only for repairs but for major parts salvage. Several illustrations are used to show the proper approach to this type of work. A copy may be obtained by writing L 193 on the accompanying postage-free postcard.

L194. Tire Care Bulletin

From Washington comes a four-page bulletin entitled, "How To Prevent Roadside Flat Tires." The data is based on surveys and tests that, according to the Office of Defense Transportation, "revealed a situation which is responsible every day for needless destruction and premature wear of millions of tires and tubes."

The bulletin goes into detail advocating a tire care plan referred to as the "Comparative Air Loss System, which requires only seconds of time and no special equipment." Stressed are the following points:

"Fact 1. All tubes lose air naturally. Fact 2. Most punctured tubes do not go flat for days or even weeks. Fact 3. Tires do not go flat until the final break. Fact 4. 90 per cent of all flats can be prevented by using the comparative air loss system. Fact 5: Actual records prove the result of this two-point method."

One half of the bulletin goes into a step-by-step procedure, including the keeping of records, of the Comparative Air Loss system of tire care. A free copy may be had by writing L 194 on the free postcard.

L195. Blind Fastener Manual

Fleetmen who have been hearing of the recent introduction of a novel, practical and thoroughly practical method of employing blind fasteners for effective and time-saving fastening of body sections, that are said do a better job than nuts and bolts or ordinary screws, will be interested to know that a four-page folder has been published explaining and illustrating this modern blind fastener which is claimed to double as a nut plate, rivet or both, and prove especially valuable where only one side of the work is available. It can be installed in metal, plywood and plastics.

Of particular interest to mechanics will be the photographic illustrations showing the step-by-step procedure. Details of preparation and the simple method of upsetting are amply illustrated.

This method of fastening should prove highly satisfactory not only on original assembly of body sections but for repairs and replacement as well. Where tubular sections are used, this method should overcome the difficulty of installing brackets, handles or other attachments.

Fleet maintenance men should have this data on file for ready reference. All necessary data will be forwarded simply by writing L 195 on the post card between these pages.

L196. Fuel Additive Data

The lowering of octanes of engine fuels is giving rise to an increased interest in engine fuel additives. One manufacturer of such a product has published a six-page folder giving thorough coverage on the subject.

The data is divided into two parts, namely, "Fuel system Problems" and "Upper Cylinder Problems." Photographs, charts and drawing amplify the text, which is non-technical in character.

A copy of this folder will be mailed to any fleet operator interested in fuel additives by writing L 196 on the postcard.

L197. Hose and Belt Guide

The 1944-45 edition of the popular "Fan Belt and Radiator Hose Guide" is off the press. Fleetmen familiar with it know that it gives everything needed to know about truck belt and hose sizes, specifications, as well as interchangeability of those products.

Due to the national paper shortage, this edition is severely limited. Thus, fleet maintenance men will do well to get their requests in immediately. To be sure of a copy write L 197 on the free postcard.

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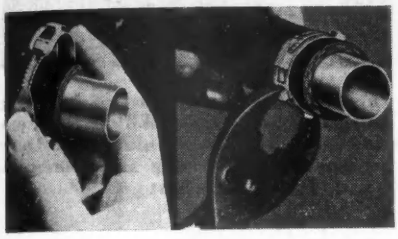
The latest in shop equipment, supplies, replacement parts and accessories developed by manufacturers for fleet operators. For more details of any product described, fill in the number on the postcard and mail. No stamp needed. Also use the postcard for additional information on any product advertised in this issue.

P244. One-Piece Hose Clamp

Here is a new one-piece hose clamp, manufactured by Tinnerman Products, Inc., Cleveland, using no



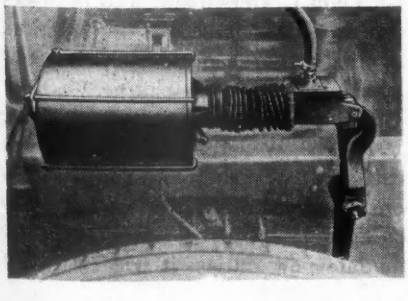
gears, thumb screws or intricate locking means. The clamp is snapped over the hose into pre-latched position by hand, as shown at left of the accompanying illustration. Final lock is made with hand pressure on ordinary pliers, as shown at right.

This new clamp has a low profile, is light in weight, and exerts an even pressure around the entire circumference of the hose. Clamp may be quickly released, for removal, with an ordinary screw driver or other pointed tool.

Use Free Postcard for More Details.

P244. Steering Booster

A simple steering booster and stabilizer has been introduced by the Empire Electric Brake Co. The booster not only enables the driver to steer a heavy truck or bus with passenger car ease, but it is claimed that it also acts as a stabilizer, affording



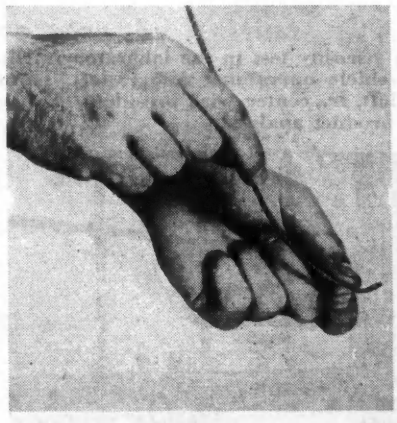
protection against over-steering and tending to eliminate road shocks, shimmy, wander and wheel fight.

The booster is designed in two types, one operating by utilizing the vacuum from the intake manifold and the other operating by compressed air.

Use Free Postcard for More Details.

P246. Spiral Abrasive

The Elek-Tro-Cut Three-M-ite cloth reinforced, spiral wound strip, illus-



trated herewith and developed by Minnesota Mining and Mfg. Co., St. Paul, Minn., is designed for removing burrs and finishing oil holes. Constructed of Elek-Tro-Cut Three-M-ite Cloth, the center is reinforced so that it can be bent, inserted down through a center and threaded through an oil hole or opening that has been causing a finishing problem. It is available in a wide range of grits, in diameters of 1/16 in. to ¼ in., and in lengths of four in. and shorter, up to 12 in.

Use Free Postcard for More Details.

P247. Hydraulic Wheel Dolly

Electric Service Mfg. Co., Philadelphia, is announcing a new type hydraulic wheel dolly designed for easy removal and application, by one man, of front and rear wheel assemblies, single or dual, on large, heavy duty trucks. It can be used in shops where inspection pits are employed.

The frame is of welded construction, thoroughly braced and designed to carry loads up to 1000 lb. It is mounted on four swivel casters equipped with solid tread, composition wheels resistant to water, oil and most acids, and of the same carrying capacity as metal wheels with added

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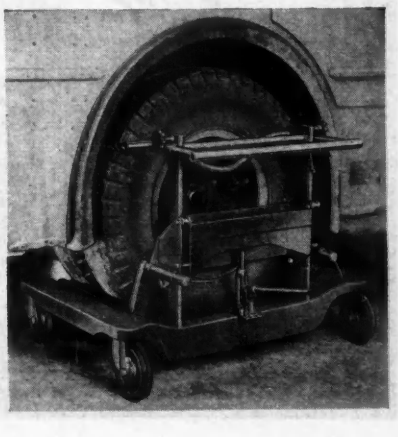


HOW THE TEST TUBE AIDS MAINTENANCE

"Time and again analysis of oil samples has demonstrated that, in certain cases of mechanical failure, the fault has not been due to defects in the assembly but to the bad effects of a poor lubricant upon the assembly."

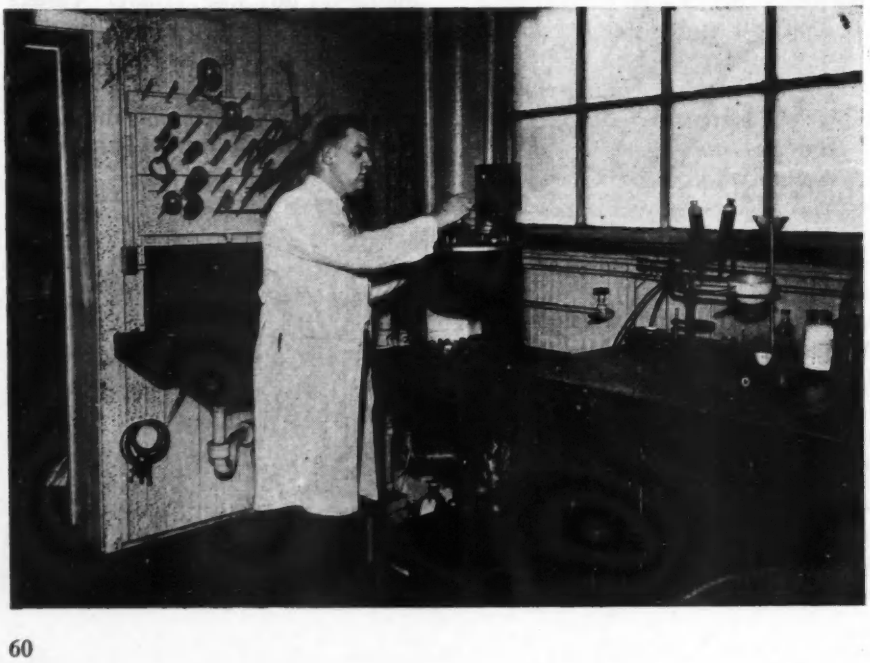
"To find a shipment of gasoline off grade is not a rare occurrence."

"Prompt analysis of newly delivered gasoline also has, at times, revealed excessive amounts of gum, which would have led to engine trouble and damage."

"No salesman's say-so is ever accepted at its face value here. Regardless of how prominent the manufacturer may be, every product is analyzed and the laboratory's decisions turned over to the purchasing agent. In a surprising number of cases, the wisdom of this procedure has been amply justified."

"There was, for example, the case of the salesman who came in full of pep and pride in his product, an additive for gasoline, guaranteed to reduce consumption and increase mileage. Backing his claims, the man had a portfolio of testimonials. His sales talk was convincing. We listened closely, then went to work on the stuff. Our chemical analysis revealed that the compound was highly acidic in nature and, if used in our vehicles, it definitely would have brought about deterioration of the parts. Such damage, if it had gotten under way in a large fleet like ours, would have been disastrous."

Below, chemist L. L. Gershbein is making a viscosity test in the laboratory maintained by Willett Co. to aid trouble-free vehicle operation. Above, left, Larry Kane, garage superintendent, and H. L. Willett, Jr., center, vice president, discuss a report made after a product analysis



Close check on the quality of fuels and lubricants helps keep Willett truck engines operating at top efficiency. Here the chemist is making a carbon residue test

Chemistry

THE EXACT science of chemistry, if put to work to check gasoline and oil, can help one do a better job of motor transportation. This line of thought, broadly speaking, was the impelling motive which led the Willett Company, Chicago contract carriers, to add to its maintenance department one of the most unusual tools to be found in any fleet maintenance shop—a chemical laboratory, complete with every type of scientific instrument needed for the task of determining how chemistry can help improve motor truck operations. A graduate chemist, Leon L. Gershbein, who possesses an impressive record of practical, applied research in the field of petroleum products, is in charge.

Launched four years ago, in May, 1940, the Willett Company's chemical laboratory has continuously demonstrated its usefulness in ever widening fields. Only recently, to accommodate new duties, it was necessary

For the purpose it serves, the Willett Co. chemical laboratory is excellently equipped. The investment has yielded satisfactory returns, not only in product quality control which, as the article points out, has prevented many headaches, but also in determining causes of certain failures and in anticipating mechanical troubles before they become serious

Aids Fleet's Maintenance

Carrier averts engine troubles by testing oil for dilution, carbon and metal residue; fuel for water, acidity, gums, vapor pressure, etc. Also tests detergents and brake fluids

by H. H. SLAWSON

to enlarge the original quarters by turning over a second room for the chemist's use.

Activities of the laboratory take two directions: 1. Cooperation in the company's preventive maintenance program; 2. to assist the purchasing department in checking the quality of all supplies and compliance with specifications.

Prior to the war, the laboratory also worked with the company's physician, Dr. John Haberlin, on chemical phases of medical investigations he was making of carbon monoxide poisoning and other matters pertaining to employee health. Upon Dr. Haberlin's entry into the Army air corps, however, these studies were set aside.

As a contract hauler, the 77-year-old Willett Company operates over 1000 trucks and trailers and, under the company's rigid maintenance program, each unit of this big fleet comes in for checking after each 1250 miles of service.

Lubrication Checked Chemically

Soon after the chemical laboratory was organized, Mr. Gershbein said, it was realized that merely going down into the grease pit and getting a number of oil samples for analysis was not the whole problem of adding chemistry to the maintenance program. Crankcase oil, when cold, does not give a representative story of operating conditions, he found. Accordingly, a standardized technique for sampling was devised to insure that the sample would be truly typical.

Records are carefully preserved of the oil analysis of each unit, so that

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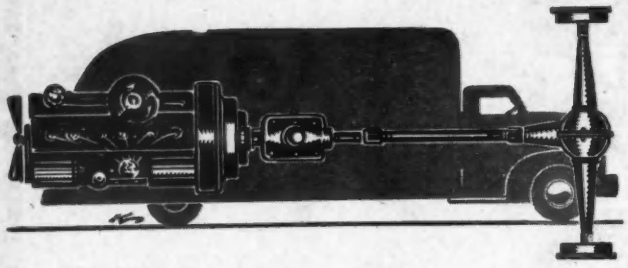

Post-War Powerplants and Transmission Lines

A critical study of the likely developments in gasoline engines, transmissions and rear axles for heavy-duty vehicles

by ROBERT CASS
Chief Engineer, The White Motor Co.

Robert Cass

NOT very long ago all our commercial airplanes operated very satisfactorily on 87 octane fuel and were able to sustain a B.M.E.P. much higher than we had considered in the truck field. Therefore, in projecting our thinking into the future, it may well be that the gasoline engine for high output per cubic inch and for large gross horsepower outputs, will be designed for the premium grade fuels. It is quite conceivable that in so doing, the industry will produce engines in which the overall ton mile cost will be surprisingly good. This then, puts squarely before us the future fuel picture and its problems. The other factors which have to be considered are the weight per horsepower, the output per cubic inch possible, and the price per horsepower of the two types.

Without recourse to mechanical means such as supercharging, it seems possible that we may have engines in the gasoline field in which our output per cubic inch could be increased as much as 25 per cent with premium fuels (90 to 95) available after the war. Naturally, this is going to be accomplished in several ways, but compression ratio changes will be one way.

The next thing which bears discussion at this stage is that of what mechanical means there are available to improve the output of engines. These come under at least two headings—solid injection of fuel, and supercharging.

Solid Injection

With regard to solid injection of fuel, that story is already well known in its application to the diesel type engine, and it is very well established that the so-called direct injection type offers promise from the point of view of output of gasoline engines. This is cited because of the story of European engines where the development has been through the cycle of the pre-combustion chamber type and the improvement which they have been able to effect by the direct injection type. The control of smoke is more difficult with a direct injection type which, therefore, calls for more frequent and better informed maintenance than with some other types of engines.

With respect to fuel injection of gasoline, it may be said that it is in its infancy as far as the truck engine is concerned. The promise is still a vague one as to the extent to which it can change the picture, but it is said that the octane requirements for a fuel injected engine are lower than with a carbureted engine. If this is conceded, it will again be obvious that a further increase in output in the gas engine can be secured. The story of cost and also maintenance will be in line with similar diesel injection systems; therefore the percentage decrease of fuel consumption will have to be of some magnitude in the neighborhood of 15 per cent, or an output of the same amount to be interesting.

Supercharging

Quite apart from what has happened in the aviation industry where the supercharger is so much a part of the engine development as to cause no comment, there would seem to be a logical place for it in the truck field if only certain conditions can be met. In the first place, the supercharger does offer to the truck engine manufacturer an opportunity to extend the range of his engines by increasing the output without the initial expense of new tooling, new patterns, etc., which is a major expenditure in the design of a full line of engines. From the operators' point of view there are a number of advantages that, in turn, can be listed as very

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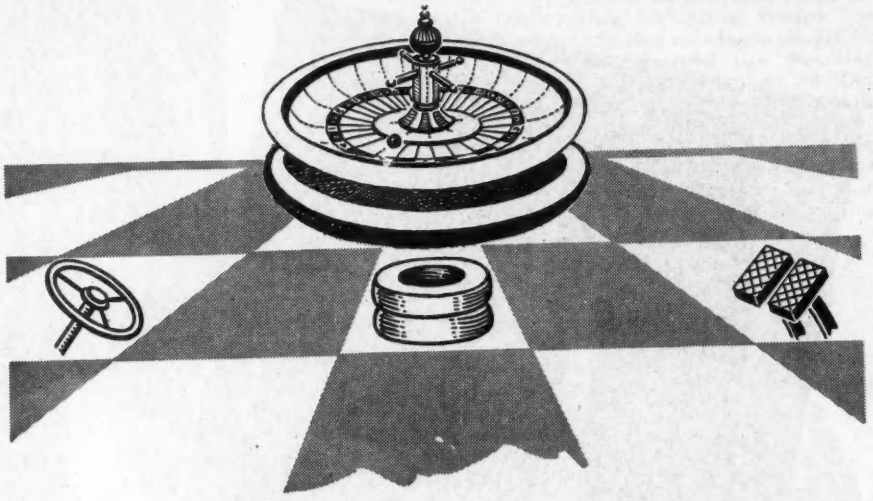
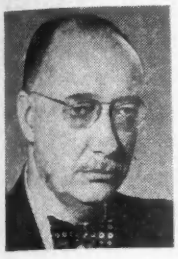


Calling the Turn on Trucks to Come

In which a well-informed member of the truck industry concludes his brave predictions of future developments in design

by MERRILL C. HORINE

Mr. Horine, one of the best-informed men in the truck industry and —by his own admission—one of the bravest, has undertaken to predict what the truck of the future will be like. He has been exhaustive in his treatment of the subject and because of its length his discussion has been presented in two parts. This month he deals with Steering, Brakes, Cab and Controls, Tires and Accessories. Last month he dealt with Arrangement, Styling, Frames, Suspension, Powerplants, Cooling, Clutch, Transmission and Drives.



Merrill C. Horine

ONE of the most surprising developments of late years has been the rise of all manner of unorthodox steering gears. Everyone seems to have been intent upon producing a gear which was at once efficient and irreversible. Unfortunately, the two are not compatible. So-called irreversibility in a gear is nothing other than inefficiency and while all manner of peculiar arrangements have succeeded in reducing a great deal of the friction which did not contribute materially to the irreversible effect, while retaining that which did so contribute, the gains along this line have too often been achieved at the expense of ruggedness, durability and freedom from rapidly-increasing back-lash.

Real gains have been made, of course, and there are better steering gears to choose from today than ever before. In heavy trucks and buses particularly, however, satisfactory steering control is to be obtained, in manually-actuated steering systems, only at the expense of excessive reduction and consequent slow response.

There appear to be two ways out: First, the development of a really cheap and reliable power steering system, on which some real work has been done and, second, a purely mechanical and manually-operated scheme which permits the use of gearing of the highest efficiency and yet positively prevents reactions from the road reaching the steering wheel. Both are bound to be more expensive than present steering gears.

There is also much to be done in reducing the friction elsewhere in the steering system than in the steering gear itself. Steering knuckles, tierod and draglink ball joints and even the innocent appearing steering column are due for critical analysis and improvement.

It will not surprise me much if before long, on long-wheelbased vehicles—particularly buses—we see the development of four-wheel steer in modified form. We may also witness before long a revolutionary change in the steering system of ponderous off-highway vehicles which will greatly simplify the problem.

Brakes

In every development, over a period of time, a point is reached when the traditional must be examined in the light of its limitations in the face of ever more exacting requirements.

Without doubt much remains that can be done to improve the behavior of the basic brake system that we have today.

Linings can be still further improved to provide needed durability without too much sacrifice of friction qualities, greater resistance to heat and moisture and less tendency to produce sound.

Drums can be improved in resistance to heat and abrasion, rigidity and anti-acoustic qualities.

The convecting qualities of our conventional brakes can be increased somewhat without sacrificing the mudproofness found so desirable.

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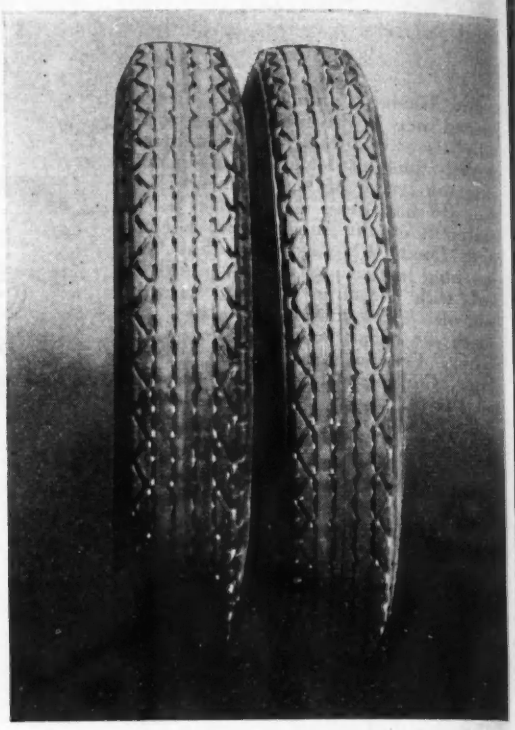


According to fleet superintendent Everett Metcalf of Kuhner Packing Co., tires at left show the ideal time for recapping—when the tread pattern just begins to disappear. Above. Two 7.50 x 20 tires just received from the recapper. This is the third time for each

Fleet Gets Six Recaps on

Kuhner Packing Co. gets 350,000 miles per tire; fleet superintendent Metcalf tells how. Three other fleetmen discuss practices that net 2 to 5 caps per tire

by A. E. HOLDEN

The wartime and pre-war tire recapping experience of four fleet operators is recounted in this article. Two are private carriers, one is a municipal fleet with on and off-the-road operation, and the fourth is a contract carrier.

Each fleet has had success and some difficulty with recaps. Most learned the hard way, but they are generous in giving the details of their experience and successful methods for the benefit of other operators. Their comments and advice should prove a helpful guide for maximum tire life for any fleet.

TO OBTAIN first hand information on the potential benefits of recapping truck tires, this correspondent recently interviewed several operators who have gained real tire economies from recaps over a period of several years.

Said Frank Proctor, traffic manager, Hillsdale Mfg. Co., Hillsdale, Mich., "We have been recapping our tires since 1941. We get double mileage at least, by using them. On many tires we get treble mileage as compared with results before we learned how to use them in a practical way."

Mr. Proctor explained this by saying that all the tires on their fleet of five tractor and trailer units average more than one recap, as follows: Most of the casings are saved for one recap; at least one-half of first recap jobs are safe for two recaps; three recaps per casing are no longer uncommon.

Fig. 1, for example, shows a 8:25 x 20 heavy duty tire that had

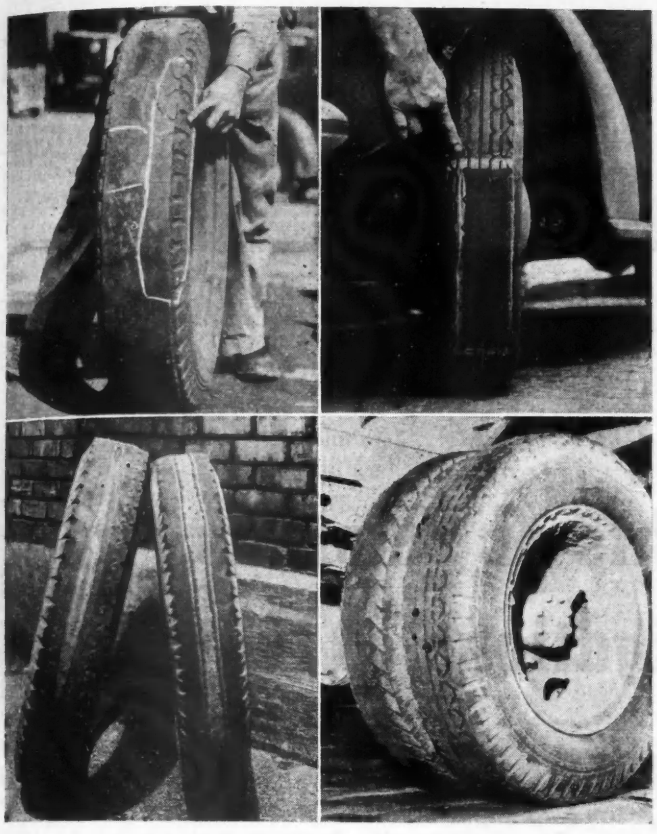


Fig. 1, upper left. This 8:25 x 20 tire used on Hillsdale Mfg. Co.'s truck-trailer had three recaps but was turned down for a fourth due to a loose shoulder. Fig. 2, upper right. This recapped tire travelled 23,000 miles and may have gone another 20,000. Worn area was caused by loose spring clip, which caused wheel to slap. Fig. 3, lower left. Tires worn too far for multiple recap possibility. Fig. 4, lower right. Right rear duals on Hillsdale County Road Commission's dump truck. Inner dual, in shop for removal for third recap; outer dual has 30,000 miles on first recap

★ ★ ★

Dual Set

been recapped three times. At this period when the rubber was worn smooth, Mr. Proctor turned it in for the fourth recap. The tire man discarded it because a loose shoulder had developed, as indicated within the chalk marks in the picture. The company reports 150,000 miles on this pre-war tire—50,000 on the original tread. Another 100,000 miles was obtained from the three recaps, each closely approximating 33,000 miles. Two recap jobs were made from pre-war camelback, the last one, wartime camelback.

As this company has used hardly no wartime new tires, they have no mileage records to report on this type, and as Mr. Proctor pointed out, they have been running their units mostly on pre-war carcasses, recapped when worn smooth. "On the average," Mr. Proctor said, "the recap tread wears as many miles as the original tread. Synthetic camelback is holding up good, and, up to now, we have had none pull off."

As quite a number of fleetmen report good recapping results on front tires, but only from fair to unsatisfactory results when used on driving wheels, this writer asked Mr. Proctor to be very specific on this point. He said:

"We use 8:25 x 20 tires on trailers and trucks. We place recaps on fronts, driving wheels and tractors alike—it makes no difference. In fact, we have two tractor-trailer units which are 100 per cent recap equipped, including two spares."

Mr. Proctor went on to say that just before the war, their products (men's garments) were transported in their own trucks to eastern seaboard distributing points, and carried from 10 to 12-ton loads; this, without effecting premature road failures from recapped tires used on these units.

However, since the war began, the company discontinued its eastern seaboard deliveries, and the longest one-way trip now is 250 miles. Mr. Proctor pointed out that 10 to 12 tons do not constitute an overload on their units, but that if they would attempt to carry one or two additional tons, such would definitely be an overload, and the tire sizes used would be inadequate to carry their loads with safety or economy.

Pointing to one tire on the front of a tractor which already had a record of 150,000 miles, Mr. Proctor said that it was now running on its second recap: 60,000 miles on original tread, 55,000 on first recap, 35,000 so far on second recap, and looks as though it will be good for 20,000 more miles.

Mr. Proctor summarized the simple rules applied to obtain these results as follows:

"Maintain proper inflation. Keep after drivers about this without letup.

"Do not overload.

"We believe these abuses are the big rubber eaters. We maintain 85 to 90 lb. in this size tire, 8:25 x 20. Our mileage records improved when we put in our own air compressor, proving to our satisfaction, that proper inflation prolongs tire mileage, and makes economical recapping safe.

"Maintain the legal speed regulations.

"Match dual tires evenly—mount two new recap jobs side by side.

"Recap a tread-worn carcass when the surface is smooth. Do not permit running a casing until the breaker strip shows.

"Select a reliable dealer who is equipped with proper inspection tools, and who will honestly discard any carcass unfit for further service. Our dealer has all these qualifications, and gives us week-end service on our vulcanizing and recap-

(Turn to Page 115, Please)

Rights of Veterans and Obligations of Industry

Selective Service recognizes a growing problem by outlining the law entitling returning veterans to their former jobs

TAKING cognizance of the increasing importance of the problem of returning veterans entering the labor market, Selective Service headquarters has issued a memorandum outlining the rights of returned servicemen and the obligations of industry in regard to reinstating veterans in their former jobs.

The responsibility for aiding veterans in securing their old positions is put on the local draft boards. Upon being discharged veterans are informed of their right to call on local boards for assistance.

A veteran is entitled by law which has been upheld by the Federal District Courts, to reinstatement in his former position or to a position of like seniority, status and pay:

1. If his position was not temporary.

2. If he entered military service subsequent to May 1, 1940.

3. If he is still qualified to perform the duties of such position. A veteran seeking his job cannot be asked to meet higher standards than existed when he left.

4. If he makes application for reemployment within 40 days after his separation from service. This is mandatory and the 40-day period cannot be extended for any reason. The first duty of local boards is to inform the returning veteran of this provision.

Employers must rehire veterans without unnecessary delay and an employer is legally bound to take back returning veterans unless circumstances have changed to make it "unreasonable or impossible" to do so. Selective Service maintains and has been unheld by the courts that "convenient" must be distinguished from "unreasonable or impossible."

Veterans who are restored to positions must be considered as having been on furlough or leave of absence during their period of service; must not lose any seniority; are entitled to participate in insurance or other benefits offered by employers pursuant to established rules relating to employes on leave of absence; and they shall not be discharged without cause within one year after restoration.

If a veteran cannot reach an agreement with his old employer local boards are required to do everything in their power to reach an amicable adjustment and may call on any local agencies for assistance. However, local boards may not institute any legal action, but must refer cases, where an agreement cannot be reached, to the state director, who will refer the case to the Director of Selective Service for legal action.

A veteran may also file suit in the United States District Court if an agreement cannot be reached. He may employ his own attorney or the United States attorney will handle the case, without cost to the veteran, provided he is satisfied that the veteran's claim is just. A veteran may also recover back pay, by legal action, if his reinstatement was unnecessarily delayed.

An important point for all businessmen to remember is that Selective Service holds that the veteran has a legal right to accept a cash settlement in lieu of his old job, thereby relinquishing reemployment claims.

Another important ruling, which is being interpreted as an open slap at organized labor would prohibit the closed shop or maintenance of membership agreement from applying to returning veterans. According to the Selective Service official interpretation, if an employer has entered into agreement, which did not exist at the time of the veteran's separation, the veteran cannot be deprived of his reemployment rights because of such agreements. He is entitled to his old job even though a non-veteran with greater seniority will have to be discharged. It is reported that this provision caught the labor leaders napping, and that they have already scurried to the White House with anguished cries of "we're being robbed."

New Procedure Urged to Cut Truck Rationing Delay

To cut Washington red tape and delay, ODT regional offices should be permitted to give final approval to applications for new trucks.

That recommendation was made by the Pennsylvania Motor Truck Association at its eleventh annual meeting and war trucking conference in Harrisburg, Pa.

As I.C.C. and WPB finally bowed out of the truck allocation picture, the association adopted a resolution recommending the following procedure to ODT:

1. When an application is approved by the district manager and his action is affirmed by the regional director, the vehicle shall be allotted.

2. When an application is disapproved by the district manager and, on appeal, the regional director reverses the district manager and approves the application, the vehicles shall be allotted.

3. When the district manager approves and the regional director disapproves the application or when both the district manager and the regional director disapprove an application, an appeal may be made to the ODT director at Washington.

"This recommended procedure," said the P.M.T.A. resolution, "is similar to that now applicable on the allotment of gasoline, applications for special permits granting relief from any provision of general orders, extension of operations and inauguration of new service."

Other resolutions adopted at the two-day conference recommended:

Improvement in the quality of motor truck parts and proper marking of inferior parts.

That all Federal wartime highway transportation regulatory bodies and their wartime regulatory orders be scrapped on the cessation of hostilities.

Establishment of a trucking industry committee to study the problem of reassimilating veterans as they are released from military service.

That the Pennsylvania Public Utility Commission reopen a proceeding brought by motor carriers protesting Railway Express efforts to monoplize collection and delivery service.

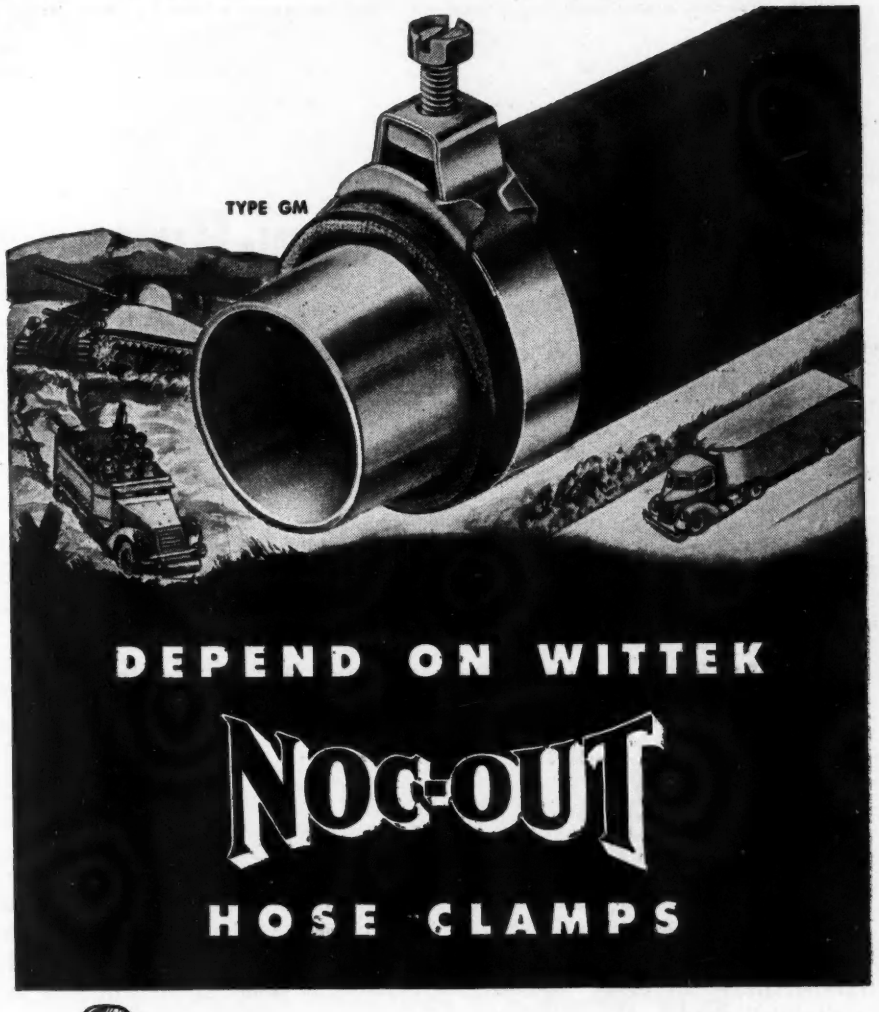
Elimination of the one-cent emergency gasoline tax levied by the State for relief purposes.

Paul W. Keeley, Valley Motor Freight, New Castle, was elected president of the P.M.T.A.

Book Lists Specialties of Returning Veterans

Ten thousand civilian jobs related to military occupational specialties of returning veterans have been listed in a 500-page volume entitled, "Special Aids for Placing Military Personnel in Civilian Jobs," soon to be used in the 1,500 local offices of the U. S. Employment Service and made available to employers and others interested.

The purpose of the volume, now on the press, is to indicate how military experience and training of veterans may be utilized in a return to civilian life. The volume, a companion piece to one published recently to assist in placing Navy personnel in civilian jobs, has created widespread advance interest on the part of hundreds of large employers who are eager to utilize the services of returning veterans.

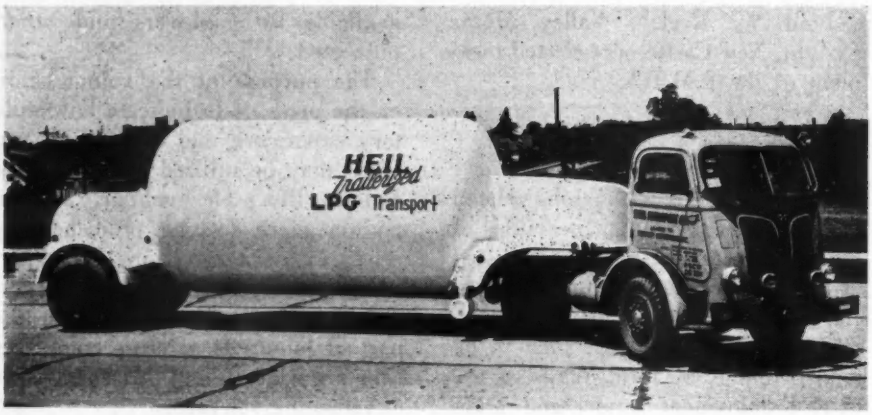


Type A—Adjustable For Replacement.

The standard of the industry. Quick-tightening, perfect leak-proof hose connections, for original equipment and replacement. For Radiator, Heater, Booster Brakes and High Pressure hose connections. Wittek Manufacturing Co., 4305-15 W. 24th Place, Chicago, Ill.

Type HP—For High Pressure Requirements.

WITTEK WMCO NOC-OUT HOSE CLAMPS



This modern "trailerized" L.P.G. transport tank carries a 4000 gal. payload of liquid petroleum gases. Suspended between axles, it features a low center of gravity. Special manufacturing processes eliminate over a ton of dead weight

Heil Designs Low-Hung Tank for Liquid Gas

Trailerized unit has 18-in. ground clearance when loaded and is built to withstand 250 lb. pressure. Saves 2000 lb. of weight

A DISTINCTLY modern carrier soon to be seen on the highways of America is The Heil Co.'s latest contribution to tank transportation—a sleek, low-hung "trailerized" unit for the movement of butane, propane and other liquefied petroleum gases. These gases, a by-product of oil wells, are compressed to a liquid state and remain liquid as long as they are kept under pressure. Similar to natural gas, but with a higher B.T.U. content, they are used extensively in the production of synthetic rubber, high octane gasoline, in internal combustion engines, to fire annealing furnaces, as a refrigerant, and for domestic heating and cooking.

The "pilot model" illustrated here was designed to transport gases at a maximum working pressure of 250 lb. per sq. in. with a net payload capacity of 4000 gal. It will also be available in working pressures from 80 to 250 lb. per sq. in. for other types and combinations of liquefied gases. Liquefied gases expand as temperatures rise. For instance, an increase of from 70 to 120 degs. in the temperature of propane gases will increase pressure from 109 to 225 lb. per sq. in. While the new Heil L.P.G. Tank is built to withstand 250 lb. pressure and has an ample safety provision for expansion, it is equipped with safety valves which blow at 225 lb. pressure in emergencies and release the load in the form of gas.

The prime objective of this patented Heil design is to provide a lower center of gravity than conventional units used for this purpose, resulting in a safer, more compact carrier on the highway and one which is easier pulling, has less side-sway, less wear and tear on tires. The 92-in. diameter pressure vessel is supported at its heads so that it is suspended between the axles of the trailer and the tractor. When loaded, the tank is carried within 18 in. of the ground. Some conception of the low center of gravity can be had by comparing this unit with the greatly elongated, small diameter cylinders of conventional types which are carried above the trailer axle and fifth wheel.

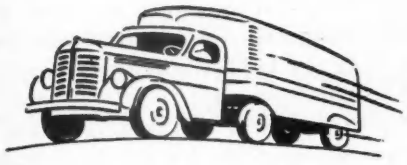
Soundly engineered fabrication of the vessel includes processes whereby it is X-rayed and stress relieved. Every inch of weld is examined to assure maximum strength and minimum stress. These processes permit using a lighter gauge, high tensile steel which saves 2,000 lb. of dead weight. Thus, with the new Heil L.P.G. X-rayed Tank a bulk hauler will be able to carry an extra payload of 2,000 lb. or 285 gal. more than with comparable tanks not having these special fabricating processes.

Another unique feature of the new unit (patent applied for) makes it possible to shift the center of gravity of the payload forward or back as required to maintain desired axle or king pin loadings.

The manhole cover and all fittings are located in either the rear or front head and are easily accessible through a hinged door. This rear compartment also provides storage space for hose and other necessary loading, unloading and safety accessories.

★ TRUCKS CARRY A WAR LOAD ★

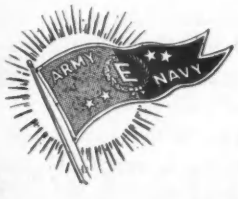
TANKER TORPEDOED...
...PLATES NEEDED...URGENT



DURING the early days of the war, many merchant ships staggered into eastern ports, their sides blown out by torpedoes from U-boats. And in many of those instances, plates or equipment, rushed to the ship yard by truck, have saved a ship from months of idleness, thus bolstering our Merchant Marine tonnage.

In the face of a manpower shortage and a lack of equipment, trucks are hauling the goods. 80 to 90 percent of local truck freight is war freight. With a nation relying on its trucks, dependable equipment is necessary to keep 'em moving.

A battery that will give the best service for the longest time is the battery every trucker needs. That's why so many choose Exides. Exide Batteries are built for long-life, complete dependability, and simplicity of maintenance. When you buy an Exide, you *Buy to Last.* Take care of it and *Save to Win.*



THE ELECTRIC STORAGE BATTERY CO., Philadelphia 32

Exide Batteries of Canada, Limited, Toronto

ODT NEWS

New Truck Rationing Procedure Under ODT

Issuance of certificates for purchase of new commercial motor vehicles is now in the hands of the Office of Defense Transportation, under the new program which became effective July 1. Action on pending applications should be facilitated by transfer of experienced personnel from the rationing and inventory branch of the War Production Board.

Attachment third axles and dollies are exempt from further rationing at this time, by mutual agreement between WPB and ODT. All other types of commercial motor vehicles, including trucks, truck tractors and trailers, are embraced in the rationing program, with the exception of taxicabs and integral type buses.

Procedure for obtaining new equipment remains the same as previously, with few exceptions. A major change provides for filing applications through the 142 district ODT offices throughout the country, instead of the 80 offices maintained by the Bureau of Motor Carriers of the Interstate Commerce Commission.

Anyone desiring to obtain a new commercial motor vehicle must file an application for a certificate of transfer with the ODT district office nearest to his home office or principal place of business. The application form will be provided by ODT, but it will be permissible to use Form WPB-663 until Sept. 1, 1944.

The usage classification list employed by WPB will continue in effect. The district ODT manager will recommend approval of an application only after determining that the new vehicle will be used by the applicant in his business and within the area indicated in his application. It is also necessary that the vehicle be devoted, without undue delay, to uses directly related to the war effort or essential civilian service.

Upon receipt of an application and after prompt investigation, the district manager will either recommend approval or disapprove it. Approved applications will be forwarded to the ODT Highway Transport Department in Washington for final action. Those disapproved will be returned to the applicants. Local appeal boards are established to consider appeals from decisions of district managers disapproving applications. When a local appeal board sustains the decision of a district manager, its decision is final.

The Assistant Director, ODT Highway Transport Department, may disapprove an application, if lack of available vehicles or any provision of the rationing order warrants. A new application may not be filed until three months after disapproval of an original application.

A vehicle purchased for use in transporting property may not be transferred to any other person or converted to any other use than originally specified, within six months from date of purchase, without written ODT approval. The only exception deals with short-term leases not exceeding ten days.

ODT also is charged with rationing new commercial motor vehicles to certain exempt Government agencies, under a system of exemption permits. Quotas for these agencies will be determined by WPB.

The rationing procedure is set forth in General Order ODT 44 and Administrative Order ODT 27.

Dick Stickel Executive Assistant to Richardson

H. Richard Stickel, formerly executive assistant to the Director of the Division of Motor Transport, ODT,

H. Richard Stickel

has been appointed executive assistant to Guy A. Richardson, director of the ODT Highway Transport Department. In this capacity Mr. Stickel will act as advisor and will represent Mr. Richardson in contacts with other governmental agencies and in other special assignments.

Tire Forms Revoked But Data Must Be Kept

ODT has amended its administrative and general orders with respect to records required of motor carriers holding either single or fleet unit Certificates of War Necessity by eliminating heretofore prescribed Forms 17 and 17A, which expire June 30.

Administrative Order ODT 9 has been amended (Amendment 3 effective July 1, 1944) to set forth in detail the following tire inspection data which motor carriers are required to keep "in any convenient form": (1) Date of inspection; (2) Inspection station number, county and state; (3) Serial number or brand of tires requiring service, and description of required tire or vehicle service; and (4) Certification of inspector that no service is necessary, or certification that such service as was required has been performed.

Forms 17 (Weekly Operation Report and Tire Inspection Record for Single Units) and 17A (Tire Inspection Record for Fleets) still may be used by operators who have a supply on hand and wish to do so.

Concurrent with revocation of these prescribed forms, ODT has re-

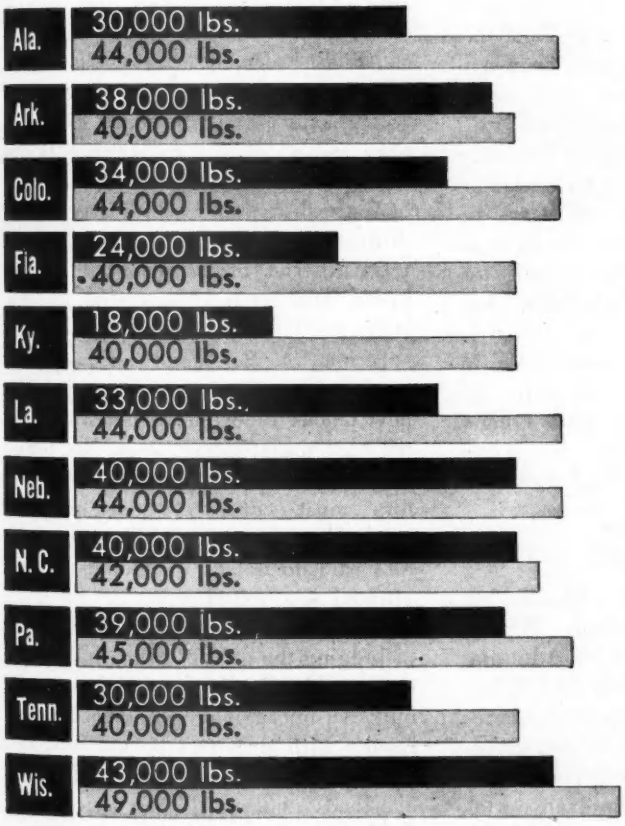
(Turn to Page 74, Please)

WILL VICTORY MEAN RETREAT?

DO YOU REALIZE that when the day of Victory arrives, many Truck-Trailer operators hauling food for your table may be forced to cut their loads in half?

Sounds ridiculous, doesn't it? But, this is exactly what would be required of them after V-Day in the State of Kentucky, for example, unless in the meantime more liberalized laws, which were adopted "for the duration only", are made permanent measures.

Yet, Kentucky isn't the only State with restrictive laws which have been modified to meet Army and Navy requests for the free flow of war materials across State lines. There are 17 other States whose liberalizing laws have not as yet been made permanent.



Figures are based on a practical estimate of gross weight allowances for a 3-Axle Truck-Trailer.

Gross-weight limit still on statute books.

Temporary war-time allowance.

In addition to the States listed, seven—Connecticut, Delaware, Indiana, Iowa, Maine, Massachusetts and North Dakota—have temporarily lifted other restrictive size and weight laws for the duration.

It is logical to assume that those who were responsible for the spawning of the hodge-podge of crippling laws in the first place, will be interested in seeing that the shackles are once again clamped on, in an effort to strangle highway transportation.

How would the restrictions of a back-sliding State affect you?

Anything which hampers the efficient operation of motor trucks and trailers, regardless of which State applies the restriction, takes dollars out of your pocket—because transportation charges are included in the price you pay for the food you eat, the clothes you wear and the other goods you buy.

AMERICA MUST NOT RETREAT

What can you do about it? You can insist to your Congressmen and your Legislators that the more liberal, uniform war-time size-and-weight standards for Truck-Trailers be adopted as permanent law, and that all other regulations which are not in the public interest be **entirely eliminated.**

Removing trade barriers for the duration is vital. However, that's not enough. They should be removed permanently!

Send for the interesting booklet "Are the United States United?" (third edition) or pick up a copy at your nearest Fruehauf Branch. Know how your State stands on the subject of trade barriers. It's important to you.

World's Largest Builders of Truck-Trailers *Service in Principal Cities*

FRUEHAUF TRAILER COMPANY • DETROIT 32

ODT NEWS

(CONTINUED FROM PAGE 72)

voked Exemption Order 21-3A pertaining to tire inspection records to be kept by fleet operators and has amended General Order ODT 21 (Amendment 10 effective July 1, 1944) to provide that records and reports shall be kept in the form prescribed in Administrative Order 9.

Ellis Longenecker Succeeds Harold Arnot

Ellis T. Longenecker, of Los Angeles, Calif., has been appointed Division Director of Property Operations of the Highway Transport Department, succeeding H. C. Arnot, of Seattle, who resigned July 1 to accept the vice presidency of the Twin Coach Co., Kent, Ohio.

Ellis T. Longenecker

Mr. Longenecker, who has been chief of the For-Hire Carrier Section of the Highway Transport Department, formerly the Division of Motor Transport, since October, 1942, is experienced in the operation branch of motor transportation. He served both in the operating and regulatory branches of the industry for more than 21 years.

Born on a farm near Laura, Ohio, June 5, 1900, Mr. Longenecker attended the public schools and Ohio Wesleyan University. He began his transportation career as a clerk and freight handler in 1921 with the Los Angeles Santa Barbara Motor Express, and was, successively, truck driver, rate and bill clerk, bookkeeper, superintendent of operations, for that company and its successor, the Motor Freight Terminal Company. In 1930 he was employed as traveling auditor for the Pacific Freight Lines and served that company as manager of the harbor division, traffic manager and superintendent of operations.

Mr. Longenecker entered government service with the Interstate Commerce Commission in 1936 as district supervisor of the Bureau of Motor Carriers in Los Angeles, and went to the ODT in March, 1942, as assistant chief of the section of operations, becoming chief in October, 1942.

Eiselstein Made Chief of For-Hire Carrier Section

Fred W. Eiselstein, of Ohio, has been made chief of the For-Hire Carrier Section of the ODT Highway Transport Department.

Mr. Eiselstein succeeds Ellis T. Longenecker, who recently was appointed director of the Division of Property Operations.

Born in Chester, Ohio, Nov. 27, 1889, Mr. Eiselstein has been engaged in transportation work since 1908, the first 10 years with railroads. Since 1917, Mr. Eiselstein has been connected with motor transportation, and for several years he has been serving as vice president in charge of traffic and operations for the Lecrome-Benedict Lines, Inc., Columbus, Ohio.

Mr. Eiselstein went to the ODT in May, 1943, and has been acting as assistant chief under Mr. Longenecker since that time.

Farm Products Order Sets Up New Controls

The Farm Vehicle Section of ODT's Highway Transport Department, with the issuance of Administrative Order 26, effective July 3, has coordinated and implemented its previous programs for the conservation and utilization of commercial motor vehicles engaged in the transportation of farm products—except dairy products (transportation of which is governed by Administrative Order 19)—from areas of production to points of destination. The provisions of the order are similar to those contained in the dairy order and bring within its scope producers, motor carriers, dealers or receivers of farm products.

In addition to authorizing the formation and functioning of Industry Transportation Advisory Committees, the new order authorizes district managers to see that all usable vehicles are put to work in order that, so far as possible, no farm products will be lost because of lack of transportation and, where necessary, to take steps toward diverting the use of certain vehicles in order to facilitate the movement of farm products within any area where an emergency might arise.

ODT Threatens to Check Truck Abuse

Operators of commercial motor vehicles are warned by the ODT that the manner in which they operate and maintain their vehicles in conformity with good maintenance practices may be a factor in determining whether or not they are entitled to new equipment.

There continues to be evidence that many motor trucks and motor truck tires are being abused and prematurely worn out by some truck operators even though the great majority of the operators are doing a very good job in conserving their equipment, the ODT said.

With the new streamlined procedure for allocating trucks by the ODT district offices, each of which has a maintenance specialist on its staff, the ODT is considering an inspection of the condition of old trucks that are to be replaced with new trucks in order to determine if the past maintenance work has been ample, the ODT explained. Operators must conserve their present trucks, it was emphasized, and operators who do not do so should not be granted new vehicles.

Many items can be used as criteria in judging the quality of maintenance on an old vehicle, the ODT pointed out. An operator who has very poor results with tires can be assumed to be a serious offender in so far as overloads and speeds are concerned. Evidence of insufficient and irregular lubrication can be observed directly on the old vehicle. The operator's purchases or requests for new parts to replace parts which have been broken or obviously abused may be another indication of poor maintenance and abusive operation.

ROLL OUT THE MACK . . .

Yes—a bottle of milk or a barrel of beer—a "Long Tom" cannon or a batch of 100-Octane gasoline—whatever you want to haul, roll out the Mack and watch the job get done. There's not an equal in the world for Mack's 44-year long record of service. There's not an equal in the world for the popular tribute paid to Mack in the phrase "Built like a Mack Truck." And the reason's simple—*there's not an equal anywhere for the ruggedness and stamina built into every hard-working ounce of every Mack!*

Mack

TRUCKS
FOR EVERY PURPOSE
ONE TON TO FORTY-FIVE TONS

BUY U. S. WAR BONDS

Mack Trucks, Inc., Empire State Bldg., New York, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts.

IF YOU'VE GOT A MACK, YOU'RE LUCKY . . . IF YOU PLAN TO GET ONE, YOU'RE WISE!

CCJ QUIZ

by ROBERT F. BAHL

Correct Answers on Page 130

This month the CCJ Quiz tests your knowledge of trailers. Try your hand on these 10 questions, scoring 10 points for each correct answer. A mark of 70 will satisfy us, but it should take a 100 to satisfy yourself. Answers are on page 124.

1

The trailer industry is really just a little past voting age. The only important development in connection with trailers that took place before 1921 was . . .

a. The automatic fifth wheel
b. Power-operated brakes for trailers
c. Tubular axles

2

Name the "leader in trailers" . . . the operator of the largest fleet of trailers in the country . . .

a. Kroger Grocery & Baking Co.
b. Borden's Farm Products Co.
c. Standard Oil Co. of Ohio.
d. Keeshin Freight Lines, Inc.

3

In which section of the country do you find the full trailer in greatest favor?

a. Eastern seaboard
b. Pacific coast
c. Southern states
d. Middle West

4

Trailers figured prominently in the news recently, when it was disclosed that a trailer served as . . .

a. Gen. Eisenhower's headquarters on D-Day
b. The meeting place of Roosevelt, Churchill and Stalin at Teheran.
c. Thomas E. Dewey's habitation, when he couldn't get a hotel room in Chicago

5

How much transportation can be made of a pound of steel? When put into railroad equipment, we find that a freight car with its proportionate weight of locomotive and tender weighs 60,301 lb. and carries a net payload of 100,000 lb., or a ratio of 1 to 1.6. The ratio of weight to payload for a 2-ton tractor with 24-ft. semi-trailer is approximately . . .

a. 1 to 1 c. 1 to 2.4
b. 1 to 1.6 d. 1 to 5

6

Continuing the comparison, how does the average speed of operation for a trailer stand up against the speed of a railroad freight car between terminals?

a. The average speed for both is just about the same.
b. The speed of the trailer is half that of the freight car
c. The speed of the trailer is 70 per cent greater than that of the freight car

7

Don't let this one stop you. In braking a tractor-trailer combination, which wheels should be braked first or fastest?

a. The front wheels on the tractor
b. The rear wheels on the tractor
c. The rearmost wheels on the trailer
d. As far as possible, all wheels should be braked in unison.

8

You have probably noticed in recent years that the front end of most semi-trailers is rounded. What is the main advantage of the rounded front over a trailer body with square corners?

a. It cuts down wind resistance
b. It provides greater rigidity
c. It shortens the distance between the front of the trailer and the rear of the cab
d. It presents a more pleasing appearance

9

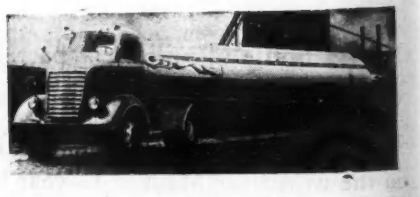
In any account of trailer progress, one of these stands head and shoulders above all other developments. It is . . .

a. Weight reduction
b. Consistent increases in length
c. The fifth wheel
d. Greater and greater streamlining

10

We end up with a series of "true or false" statements. Score two points for each correct choice.

a. Early trailer axles were fabricated from solid rectangular steel bars. True? False?
b. I.C.C. safety regulations call for automatic application of trailer brakes in case the tractor and trailer should become disconnected. True? False?
c. Trailers have carried loads as heavy as 150 tons. True? False?
d. Trailers are used to haul tanks to the battlefront. True? False?



"It's an ill wind that blows nobody any good" for it took a war, with all its drastic shortages of both drivers and equipment to show Great Lakes Greyhound Lines the way to hauling economy. The picture shows a 4,000 gallon Fruehauf tank-trailer pulling out of one of Greyhound's fuel storage depots near the entrance to the Ambassador Bridge in Detroit. The unit is en route to Port Huron, Michigan, some 70 miles away, where many Greyhound busses are refueled. With the addition of this new tank-trailer to the fleet, just one driver does the work of four.

Around the Globe

Snap-on Tools – THE CHOICE OF BETTER MECHANICS

Snap-on Tools
THE CHOICE OF BETTER MECHANICS

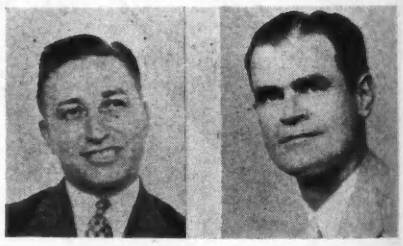
Thousands of American mechanics are G. I. Joes today . . . carrying America's service front right around the world. In arctic outpost or jungle flying field "Joe" is still the world's most capable, resourceful mechanic . . . and the finest, fastest tools add speed to his skilled hands. Wherever America works or fights, Snap-ons stand out as *the choice of better mechanics!*

SNAP-ON TOOLS CORPORATION, 8026-H 28th Avenue, Kenosha, Wis.

CCJ NEWSCAST

Kenneth K. Kohnitz, left, appointed regional coach manager for Reo Motors, Inc., operating under the Philadelphia branch. E. W. Stoner, right, promoted to sales manager in charge of industrial sales of the Haskelite Mfg. Corp.

The Raybestos Division of Raybestos-Manhattan, Inc., Bridgeport, Conn., has promoted Norman Leeds, Jr., (center) to general sales manager; Sidney E. Shepard (right) to director of replacement sales, and James L. McGovern, Jr., (left) to supervisor of replacement field sales. Other appointments include those of Jerome W. Brush, Jr., as manager of the rubber products department; A. A. Woodruff, Jr., as manager of the industrial products department; Frank Crook, as manager of transportation sales, and C. T. Begg as director of service sales



Left, C. T. Bloom, appointed sales manager of adhesive products for automotive trade with headquarters in Detroit, and, right, J. E. Johnson, named sales manager of adhesive products in the eastern division of Minnesota Mining & Mfg. Co. with headquarters in New York

James W. Stokes (left) and George L. Smith (right) new field representatives of Studebaker Corp.

Gross Weight Favored in Uniform Vehicle Code

Eight changes in the five acts of the Uniform Vehicle Code and the Model Municipal Ordinance were approved by the Committee on Uniform Traffic Laws and Ordinances at a meeting in Washington this month.

The Committee is a part of the National Conference on Street and Highway Safety. Its recommendations will be referred back to the organizations making up the Conference.

A number of proposals were tabled, either because of insufficient interest, or because committee members preferred not to raise controversial issues at this time. Among these were suggested revisions having to do with vehicle size and weight; speed regulations and lighting equipment.

In addition to minor changes clarifying language, the following revisions were recommended by the committee:

1. Section to prohibit local governmental units from erecting traffic control devices on state highways in cities unless approved by the state highway department.

2. Section on use of hand signals reworded to give emphasis on position of vehicle and actions of driver when turning or stopping rather than on hand signals.

3. Sub-section added to require, on application for registration and certificate of title, statement of gross weight of trucks.

4. Section added authorizing state highway departments to regulate parking on freeways.

5. Section added prohibiting angle parking on state and federal highways.

6. Section added authorizing local authorities to establish certain pedestrian regulations, including prohibition of crossing against a red traffic signal and prohibition of crossing streets at mid-blocks in business district or along major streets unless signs are displayed permitting such crossing.

7. Sections added permitting the legal use of chemical tests for the determination of intoxication.

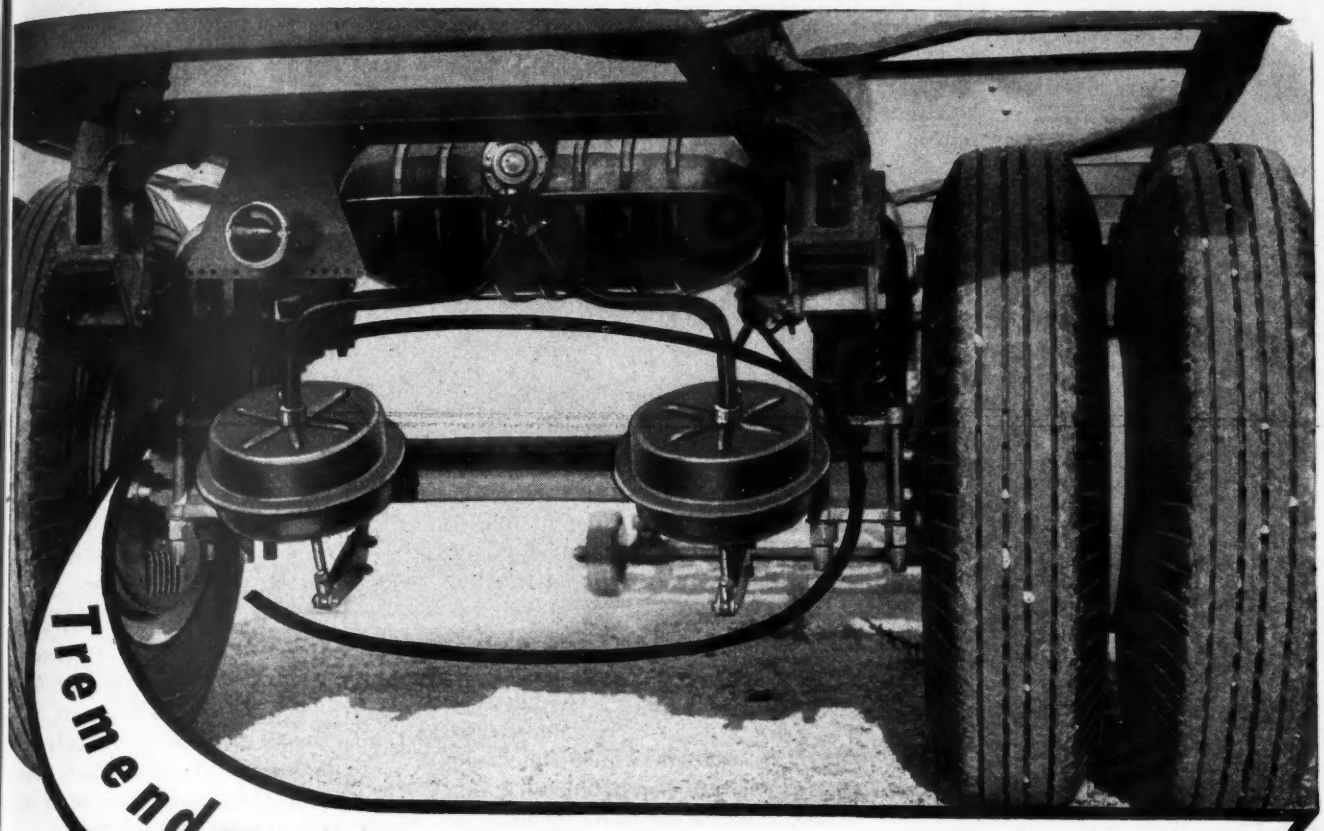
Forty-two members of the Conference attended or were represented. George Wellington, of the Motor Carrier Bureau, Interstate Commerce Commission, presided.

Vehicle Administrators Back Uniform Laws

The American Association of Motor Vehicle Administrators, at its annual meeting in Chicago, June 20-23, approved a report calling for uniform state laws regulating highway transportation and voted to assume full responsibility of leadership in seeking remedial legislation. The action originated in a report of the Reciprocity Committee of AAMVA, approved without a dissenting vote in the final session, calling for the drafting of recommended uniform laws relating to motor vehicle reciprocity and size and weight regulations. It was admitted that unless the Association takes the lead in endeavoring to break down the State barriers it will be severely criticized, and will again invite a movement to have the Federal Government establish a uniform standard for interstate operation of motor vehicles.

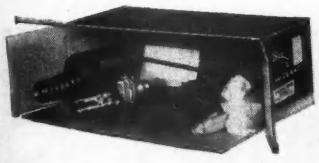
It was recommended that the following be among the subjects which

(Turn to Page 80, Please)



Tremendous Braking Power in Reserve!

MIDLAND KITS
Contain Every Needed Part—



Every nut, bolt and screw, and complete instructions for installing.

● If you know power brakes, this view showing Midland vacuum chambers tells you that the outfit ahead is under perfect braking control—thanks to the tremendous reserve power and smooth, positive action of Midland Vacuum Power Brakes.

The heavy loads and tight delivery schedules of today demand just such braking ability—to safeguard both equipment and on-time deliveries.

Midland Vacuum Power Brakes are designed and engineered especially for truck and trailers. See your Midland distributor, or write to us for complete information.

THE MIDLAND STEEL PRODUCTS CO.
10605 MADISON AVENUE, CLEVELAND 1, OHIO
Export Department: 38 Pearl Street, New York City

MIDLAND
CHRISTENSEN
POWER BRAKES

CCJ NEWSCAST

(CONTINUED FROM PAGE 78)

should be given first consideration in drafting uniform legislation:

TRUCKS AND TRAILERS

1. Establish a uniform size and weight for interstate commerce.
2. Uniform lighting requirements in all States for interstate commerce.
3. Reciprocity on all motor vehicle taxes and fees for operators meeting the requirements of his own State.

DRIVER'S LICENSE

1. Uniform recognition of valid driver's and chauffeur's license of various States.

Treasury Revises Sale of Surplus Vehicles

The Treasury Procurement Division has recently revised its originally announced policy and procedure governing the disposition of surplus military vehicles through dealer channels, by adopting a negotiated price procedure and a system of allocation based upon state truck registrations. Its various regional offices are expected to effectuate this new policy in disposing of all Army trucks declared surplus in the future.

Previously, sales of the Army's surplus used trucks were made to dealers upon a competitive bidding basis subject to OPA ceiling prices. Due to the fact that most dealers bid for the trucks at the top ceiling price and since many of the trucks required a considerable amount of reconditioning before resale to the ultimate user, Treasury Procurement found this practice to be rather unsatisfactory in that it was likely to encourage "black market" dealings and, consequently, was in need of revision.

Regular Gas Octane Rating Cut from 72 to 70

The Petroleum Administrator for War has just directed all refineries to drop the octane rating of housebrand (or regular) gasoline from 72 to 70 octane to conserve tetraethyl lead in order to meet urgent military demands for 100-octane aviation gasoline.

This directive, effective July 14, was in the form of a telegram sent to all U. S. refiners which stated, in part: "You are hereby directed not to manufacture or blend regular or housebrand gasoline to produce a product having an ASTM octane number above 70 or premium gasoline having an ASTM octane number above 76."

AMA Reelects Officers

For the seventeenth consecutive year the Automobile Manufacturers Association has chosen Alvan Macauley of the Packard Motor Car Company to head the organization.

Serving with President Macauley are Paul G. Hoffman of Studebaker Corp. and Robert F. Black of White Motor Co., vice presidents; George W. Mason of Nash-Kelvinator Corp., treasurer, and Albert Bradley of General Motors Corp., secretary.

Directors, whose terms had expired and who were re-elected are B. E. Hutchinson of Chrysler Corp., C. E. Wilson of General Motors Corp., Robert F. Black and Alvan Macauley. George Romney is general manager and Alfred Reeves is advisory vice president.

National Buys Arrowhead

National Motor Bearing Co., Inc., Redwood City, Calif., has purchased Arrowhead Rubber Co. of Los Angeles. The purchase is to insure National a steady, reliable supply of synthetic rubber flanges, which constitute a vital element of some of its recently perfected oil seals.

New Whiz Distributor

Blake, Moffitt & Towne, San Francisco, is now distributing the Whiz industrial products line manufactured by R. M. Hollingshead Corp., Camden, N. J.

(MORE NEWS IN BACK PAGES)

Royce G. Martin, the new president and chairman of the board of The Electric Auto-Lite Co., Toledo, Ohio

Harold T. Youngren, who has been named director of engineering development of Borg-Warner Corp. He was chief engineer of Oldsmobile since 1933

L. G. Gilmore, who has been appointed advertising manager of National Battery Co., succeeding Kenneth Dawkins, now a Navy ensign

Men and equipment are given last minute inspection before a convoy of Federal trucks, hauling mobile refrigeration units, begins its trip carrying fresh meat, medicine and other perishable supplies to our fighting men in the front lines. Federal has built many of the largest trucks in use by our Armed Forces and those of our Allies, specializing in extra heavy duty four-wheel and six-wheel drive vehicles. The tractor trucks here pictured are cab-over-engine, four-wheel drive military models, powered with engines of 529 cu. in. displacement. The 50 calibre machine gun mounted over the driver's seat is capable of giving a warm reception to low-flying hostile aircraft, while the rapid fire equipment and "bazookas" carried by the convoy detail afford protection against enemy ground forces. As indicated by the white bands on the bumper ends, much of the Army's supply activity in combat zones is carried on at night under blackout conditions

Photo Courtesy of Mack International Motor Truck Corp.

BUILT TO GO *where the going is Toughest!*

Landing on the beaches, crawling along shell torn highways, or where there are no highways at all, these prime movers are being battle tested today. Tested not only for their endurance in the present struggle but for their ability to meet the exacting specifications of the trucks you will require for peacetime operation.

Not the least of the reasons for this high ability rating is the fact that they are built on PARISH pressed steel heat-treated frames. PARISH frames are made of special steels and alloys and have a fatigue value 200% greater than steels commonly used. They are not affected by continuous side, vertical or end stresses, but "spring back" immediately to their original position holding all parts attached to them in true relation to each other.

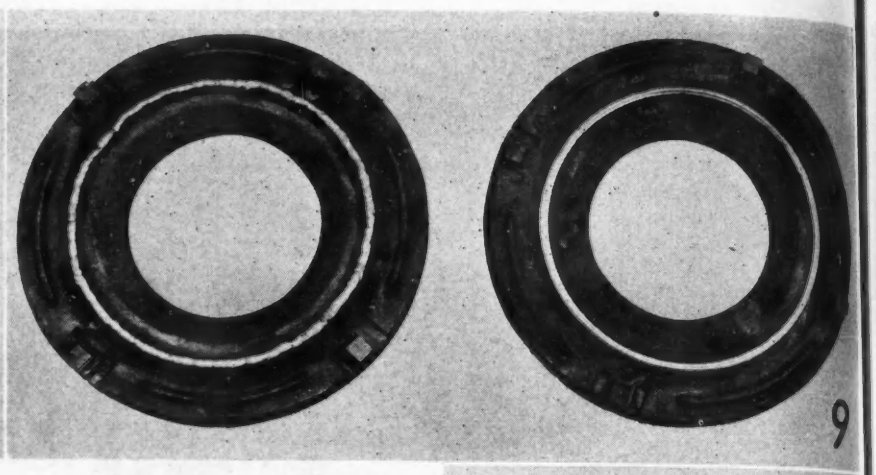
For your wartime or peacetime requirements be sure to specify PARISH pressed steel heat-treated truck or trailer frames.

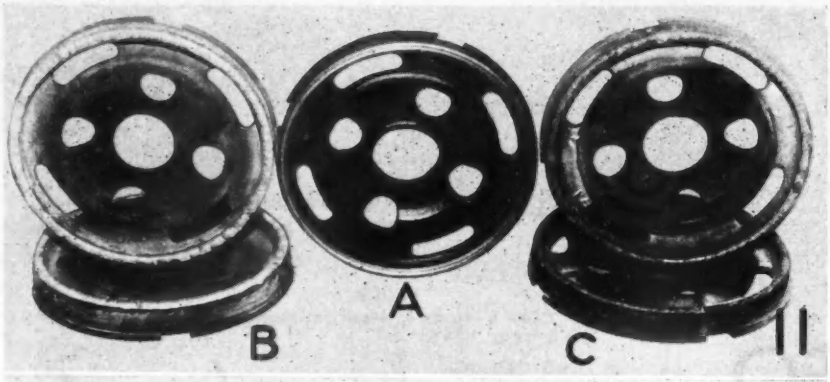
Our entire facilities have been turned over to the manufacture of heavy duty frames and other products necessary for the promotion of our National War Effort.

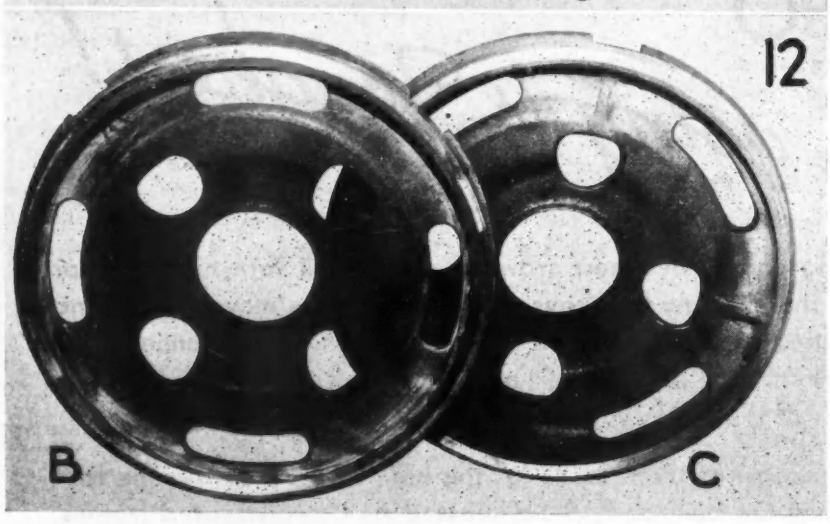
PRESSED STEEL HEAT-TREATED FRAMES FOR TRUCKS AND TRAILERS

PARISH PRESSED STEEL CO. *Subsidiary of* **SPICER MFG. CORP.**
READING, PA.

Western Representative: F. Somers Peterson, 57 California St., San Francisco, Cal.







Another type pressure plate repair. Fig. 11, top, plate as received, A, bronze welded plate at B and cast iron welded plate at C. Fig. 12, below, plates B and C after machining

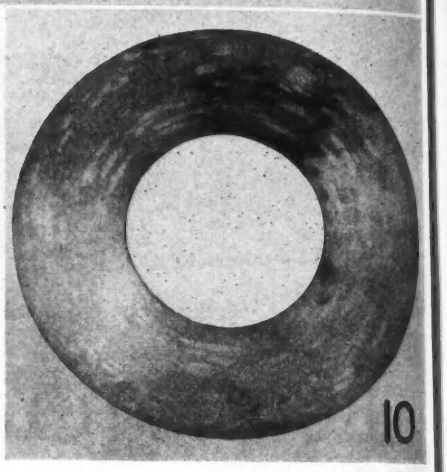


Fig. 8, top at left, worn clutch plate which author rebuilds with bronze or cast iron, preferring the former. Fig. 9, top at right, reverse sides of two such plates after welding, left, and after machining, right. Fig. 10, above, same plate as in Fig. 8 after refacing. Spots are flaws in casting

Welding Turntable Eliminates Block-Ups

(CONTINUED FROM PAGE 57)

turntable, and a transmission case which has had an egg-shaped bearing hole rebuilt with bronze and the low temperature, surface heat method of welding. The case is attached to the center of the turntable by a swiveling or center bolt.

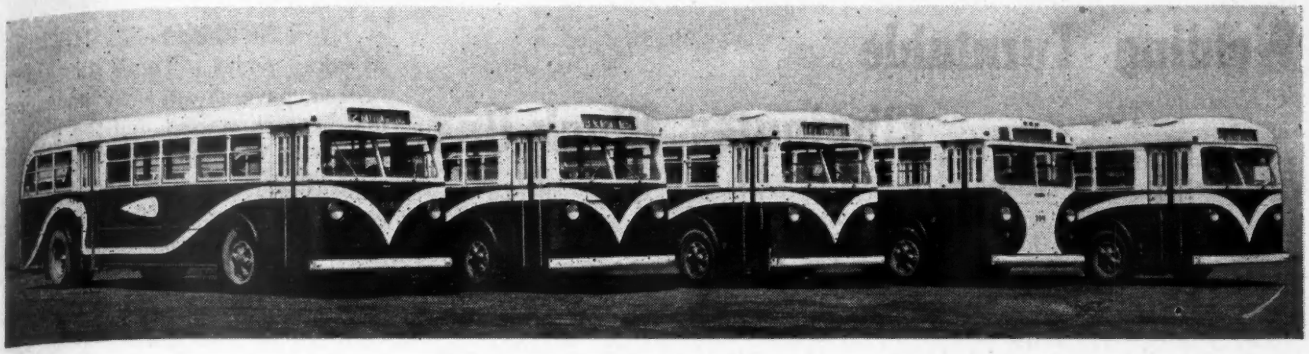
Here again, the weld was one continuous job. Either the case alone was turned on its center holding bolt, or the plate to which it is bolted was turned. The inner surface and outer surface, around the circumferential weld, was made by turning the wheel. For the inside weld, the table was dropped, then raised again so that the part or surface marked with the arrow was uppermost and under the torch.

While it is possible to toss a job like this around on the bench and make a good job of it with bronze and the low temperature method, it should be evident that a device such as the turntable will expedite the work considerably.

This next job, Fig. 5, if done on the bench would have had to be repositioned at least 50 times, by a count, for the inside and outside welds, whereas with the turntable positioner it was again one continuous smooth welding job.

The hole was built up around its inner circumference, Fig. 6, to make up for any misalignment, when the

(TURN TO PAGE 84, PLEASE)



10,950,000 Miles with Valvoline Protection!

THE CINCINNATI, NEWPORT & COVINGTON RAILWAY CO.
INCORPORATED
COVINGTON, KENTUCKY

May 4, 1944

Valvoline Oil Company
1761 Elmore Street
Cincinnati 23, Ohio

Mr. J. J. McGraw

Dear Mr. McGraw:

The Cincinnati, Newport & Covington Railway Company operates a fleet of sixty-four buses, practically all Macks, supplying service to Northern Kentucky communities in the Cincinnati area. Hilly terrain, war-time overloads, parts and man-power shortages, have made maintenance a series of headaches. For example, each unit averages double the mileage that it traveled before Pearl Harbor. Except for a "shopping-around" period at the start of our bus experience, Valvoline Lubricating Oils and Greases have been used for eight years.

Changed engine design of the newer models and changed engine location about four years ago created a varnish condition. To solve this problem we used Valvoline "HPO" experimentally for a year, and finally adopted it for the whole fleet. We have found that the best lubricant and reasonable crankcase oil change periods solve most troubles. We believe around here that oil is cheaper than motors.

Very truly yours,

THE CINCINNATI, NEWPORT & COVINGTON RAILWAY CO.

A. M. Lichti
Superintendent of Equipment

A. M. Lichti

Ret Hunter
In charge of Garage

"WE BELIEVE . . . OIL IS CHEAPER THAN MOTORS,"

Says A. M. Lichti, Superintendent of Equipment,

Cincinnati, Newport & Covington Railway Co., Covington, Ky.

This fleet of 64 buses has rolled up a total of 10,950,000 miles in the past eight years. With fleet units averaging double their pre-war mileage, Mr. Lichti has found in Valvoline HPO the answer to sludge, oil-line stoppages and many other problems that beset today's overworked motors.

Whether your fleet is large or small, Valvoline lubricants will give you trouble-free extra mileage. Let Valvoline Fleet Laboratory Service give you an impartial analysis of your own requirements — write to your nearest Valvoline office *today*.

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New York-Chicago-Atlanta-Los Angeles-Vancouver
REFINERY IN PENNSYLVANIA

COSTS MORE TO MAKE — COSTS LESS TO USE

VALVOLINE

The 1st Pennsylvania Oil

Welding Turntable Eliminates Block-Ups

(CONTINUED FROM PAGE 82)

machinist went to work on it, so that it could be again brought back to standard. As thin as this skin of bronze is in this short semicircle, it has penetrated the surface of the cast iron and will stay put until the case meets with another accident.

The preparation of the case consisted of grinding the broken section one-third through its outer side, grinding the holes oversize and steel grit blasting. It was bronze welded on the positioner without any more heat than that generated by the torch in making the weld. In other words, no pre- or post heating. Within 45 min. it was cool enough in the weld area for inspection and its trip to the machine shop for finishing.

The bolt holes, it will be noted from the illustration in Fig. 7, again are drilled and tapped in solid bronze.

Clutch pressure plates, worn as is the surface of the one shown in Fig. 8, can be repaired by the arc or bronze welding by the low temperature surface weld method. Individual plates from time to time also have been built up with cast iron. But for speed, when we have a dozen or more at a time, and after having given a face lifting operation to at least a half a thousand, we think the use of bronze from every angle is the most satisfactory method, both for short time in welding and ease in machining.

The opposite side of this plate wears very little if at all, all the wear or most of it takes place on the surface shown in Fig. 8.

The procedure to be followed then is either to have the machinist take a skin-like cut off the raised ring or clean the opposite side with steel grit and build up with bronze, without any pre-heating. The surface heating of this raised ring is just enough to permit the bronze to melt and tin the surface, after which from ⅛ to ¼ in. of bronze is built up around this ring on which the clutch fingers make contact and ride.

The plate on the left of Fig. 9 is built up with bronze. The plate on the right has the built up bronze turned off to standard or above standard, which can be done at times and permits more than one facing off operation on the opposite side before again coming to the welder for another building up job.

Some of these plates, over a period of years, have had this same reconditioning job done on them as three times—we marked them for identification in case they might be returned for another face lifting job after a period in service. While we have done many hundreds of these plates, not more than one in a hundred have ever broken while being worked on by the welder. Those that have broken, have shown on examination that a crack started and the welder, even with the slight amount of heat used, had enough expansion take place in the cracked zone to open it so that it was visible and the plate immediately junked.

The badly worn side of the plate shown in our first clutch plate photograph is shown in Fig. 10 as it looked when faced off and ready for reassembling.

Both sides of this plate are more easily turned by the machinist when using a carboloy tool bit. The hard spots shown on this plate make the use of the carboloy tool a must. It stands up better with a surface such as this to cut, than any other tools.

And it might be well to add here that the welder had no hand in put-

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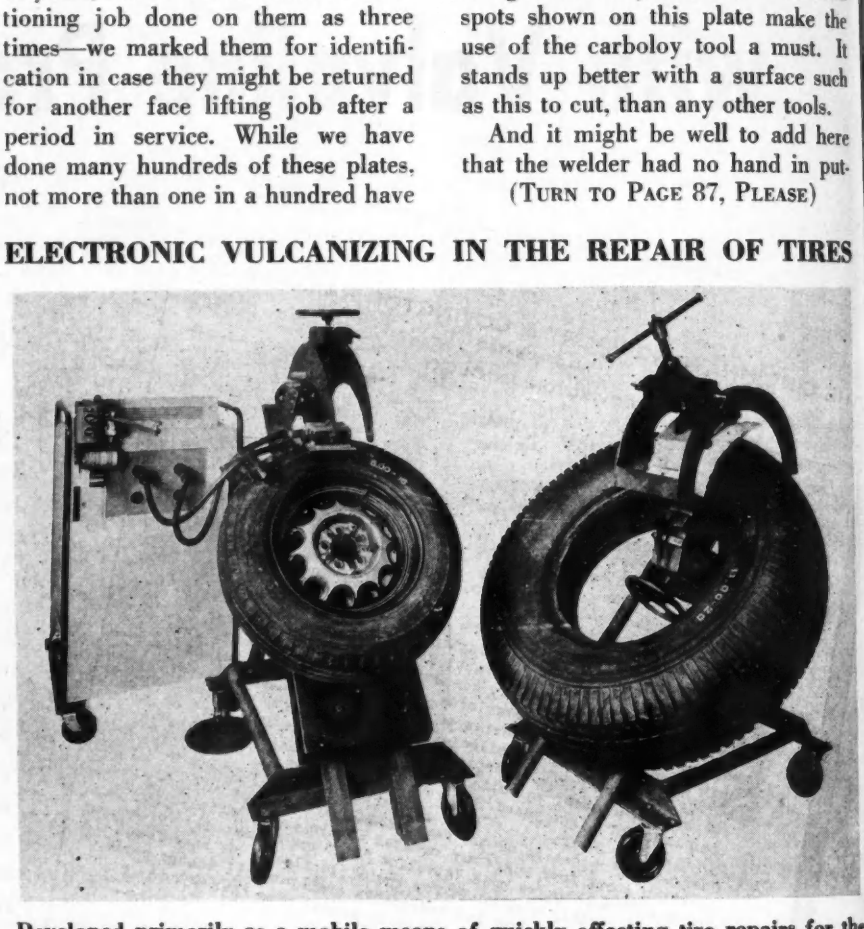
ELECTRONIC VULCANIZING IN THE REPAIR OF TIRES



Developed primarily as a mobile means of quickly effecting tire repairs for the armed forces, the electronic method of vulcanizing introduces a radically different principle of heat application. Heretofore all vulcanizing heat has been by means of conduction from either steam or electrical resistance metal molds or open steam chambers. It is obvious then that when heating by conduction, the portion of rubber next to the hot steam or mold must be the medium to carry the heat to the inner or deeper rubber areas, consequently the curing of a patch varies with its depth. Electronic heating changes all this in that the application of heat to all portions of the patch is the same regardless of its depth. The photograph shows the complete "Vulcatrone" development to date. Two types of tire fixtures are shown. The one on the right is designed to vulcanize small sectional and spot repairs. The one at the left handles spot repairs only but has the feature of being able to cure sidewall, corner or tread patches to cord depth without removing the tire from the rim. Both units have a range of from 6.00 x 16 to 14.00 x 24. The sectional repair unit is based on the principle of having the material to be heated placed between two spaced electrodes. The spot repair unit utilizes the electrostatic field in a new and novel manner by having both electrodes at the outer surface of the tire. Research is being conducted toward applying the same basic principles to effect large sectional repairs and recapping. This project was instigated by Lt. Col. C. W. Vogt and developed in conjunction with Lakso Co., of Fitchburg, Mass., Lt. Col. Vogt at the time being coordinator for Overseas Tire Reconditioning

WELDING TURNTABLE ELIMINATES BLOCK-UPS

(CONTINUED FROM PAGE 84)

ting these hard spots in this piece; not this time. We can tag the foundry this time for sure. On the other hand, the light heat used in making the bronze weld often softens these hard spots considerably, which has been noted when turning a plate that has not been built up with bronze and one where bronze has been added to the opposite surface.

Some of the bronze rods used also make the carboloy tool an advantage, as some are more severe on the regular tool bits than is gray iron.

Another type of clutch pressure plates also built up with either bronze or cast iron, is shown in Fig. 11. The wear is on the built up surface and the machine work is also done on this side. Either wire brushing, grinding or steel grit blasting cleans the surface for the building up operation.

The center plate, A, in Fig. 11, shows the condition when received by the welder. Plate B has been bronze welded, and plate C has been built up with cast iron. Fig. 12 shows the bronze welded plate B turned, and plate C built up with cast iron finished and ready to go back in service.

In many cases, and this is one such case, cast iron can be flowed onto a cleaned surface with the low temperature, surface heat method just as bronze can. Moreover, it can be machined, if certain precautions are heeded. While the application of cast iron in this procedure is not offered as a substitute for the regular method of melting the base metal and then melting the cast iron rod into the molten base metal, this low temperature and surface heat idea has many useful purposes when using a cast iron rod in the same way we use the bronze rod; that is, bringing the base metal to a high red heat, somewhat higher than when bronze welding, then melting the cast iron rod and flowing or pushing it around with the torch flame over the red hot *but unmelted* base metal. Sufficient penetration or adhesion of the molten welding rod to the unmelted base metal is had so that surface can be built up and are more or less machinable. This procedure will be more fully described in another article.

END

(Please resume your reading on P. 58)

Two Sessions in DeVilbiss School for Refinishers

The DeVilbiss Co., Toledo, Ohio, announces that two one-week sessions in the second half of its 1944 School of Spray Painting will be devoted to the instruction of automotive refinishers.

A leading maker of spray painting equipment, DeVilbiss will admit free all regular users of its products. The same ground will be covered in the first session, starting September 11, and the second, starting December 11. DeVilbiss-trained spray painting experts will be in charge of classroom instruction and shop work at both sessions.

To make sure of reservations, automotive refinishers interested are urged to write at once to the DeVilbiss Co., Toledo 1, Ohio.

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LOWER REPLACEMENT COSTS
Specify HANSEN
No. 73-L
No. 60
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WHETHER used as original equipment, for re-equipping or replacement, the ruggedness, strength and durability, Hansen Body Hardware lasts longer and cuts maintenance and renewal costs.
Built to withstand the severe usage of commercial body service, and thoroly tested on all types of bodies, trailers and tanks, Hansen Hardware maintains its reputation for quality and its record of sustained performance.
If you are designing, building or having built new body equipment, or are converting or overhauling used units, weigh carefully the advantages in favor of Hansen and use it for all-'round satisfaction and service. Most all tank units and the majority of custom-built bodies and trailers are Hansen-equipped.
If you do not already have one, send for a copy of our latest catalog showing the Hansen line of Hardware and one-hand automatic Tackers.
HANSEN
HARDWARE for Commercial Bodies
A.L. HANSEN MFG. CO.
5047 RAVENSWOOD AVE., CHICAGO 40, ILL.

American Accessories Corp. Acquires Besler Brake

By acquiring the Power Brake Division of the Besler Corp., recently, the Aircraft Accessories Corp. becomes manufacturer of what is believed to be one of the most complete lines of brake equipment for commercial motor vehicles in the United States.

The Besler brake operations will be moved from Emeryville to Burbank, Calif., and incorporated with the Power Controls Division of Aircraft Accessories. This concern now is producing new and improved air brake valves for trucks, trailers and buses and a hydraulic power brake system for trucks and buses.

Manufacturing activities of the Besler vacuum type brakes will be expanded immediately to meet the pressing demand for this type of equipment. By drawing on its experience as one of America's largest manufacturers of brake control valves for aircraft parts, Aircraft Accessories brings new developments into the automotive brake field.

Chicago APEX

WORLD'S FINEST FOOT POWER RIVETING MACHINE

Relines brakes—refaces clutches with original factory accuracy. Handles any size job from the smallest to the largest—passenger car, truck, bus, army and airplane brakes using tubular rivets. Truck fleet operators find that this heavy, powerful relining machine does the job better, quicker and with less effort. Delining, drilling, countersinking, riveting, straightening and grinding is accomplished without the operator leaving the machine. Actually, it's a complete relining-refacing department. Every known labor saving feature is incorporated in it's design. *Write for catalog of the complete "Chicago" line.*

TESTED AND APPROVED FOR U. S. ARMY AND NAVY USE

CHECK THIS LIST OF FINER FEATURES.

★ SET BACK DELINER . . . Full vision clearance. Motionless, adjustable knockout punch. Built-in old rivet collector.

★ DEEP THROAT . . . For easy working.

★ ADJUSTABLE ANVIL . . . Quickly set for any length rivet.

★ LOW HEAD . . . Specially designed to facilitate work even on small diameter bands.

★ SHOE STRAIGHTENERS . . . Built in

★ DRILLING UNIT . . . Two-speed, V-belt drive, no hand pressure required, foot operated.

★ GRINDING UNIT . . . Fully machined, large table, 6¼" cushioned abrasive drum.

★ CAPACITY . . . Up to ¼" diameter tubular or solid rivets.

★ POWERFUL . . . New toggle lever design.

★ QUIET . . . No noisy clatter.

Chicago Rivet AND MACHINE CO.
9681 W. JACKSON BLVD., BELLWOOD, ILL.
(Chicago Suburb)

POWERPLANTS AND TRANSMISSION LINES

(CONTINUED FROM PAGE 62)

desirable. For the gain in horsepower, there should be less weight as compared to an unsupercharged engine of the same horsepower. The thermal efficiency of the engine should be better; in other words, there should be less heat loss to cooling. There should be less friction horsepower in the supercharged job because, obviously, pumping losses will be lower in the small bores. By virtue of reduction in bore size in the supercharged engine, compression ratio can be higher with the attendant advantages of better specific fuel. In terms of further reduction in weight, it is anticipated that less radiator will be required. We must, however, consider the life expectancy —supercharged versus unsupercharged—and herein we may have some disadvantage.

As far as inertia loading of bearings is concerned under supercharging, certainly the smaller bore engine will be in the more favorable position. With regard to high torque low speed operation, the explosion pressures will create higher loadings and, therefore, bearings will have to be scrutinized pretty carefully to make certain that the life is satisfactory. If all truck drivers were to keep their engine speeds up where they belong, the problem of high loading of bearings at low speed wouldn't exist, but the experience with diesel engines in the early days indicates that drivers are inclined to use an engine in its lower speed range.

The pistons should certainly not suffer too unfavorably in the supercharged engine from the point of view of life, but if it is questionable as to whether our ring life in either engine is as good as it should be, it might easily be worse in the supercharged job because the heat increase would be a factor. All of this has no relation to the kind of supercharger and unless it is possible to obtain certain characteristics in supercharged designs, all these advan-

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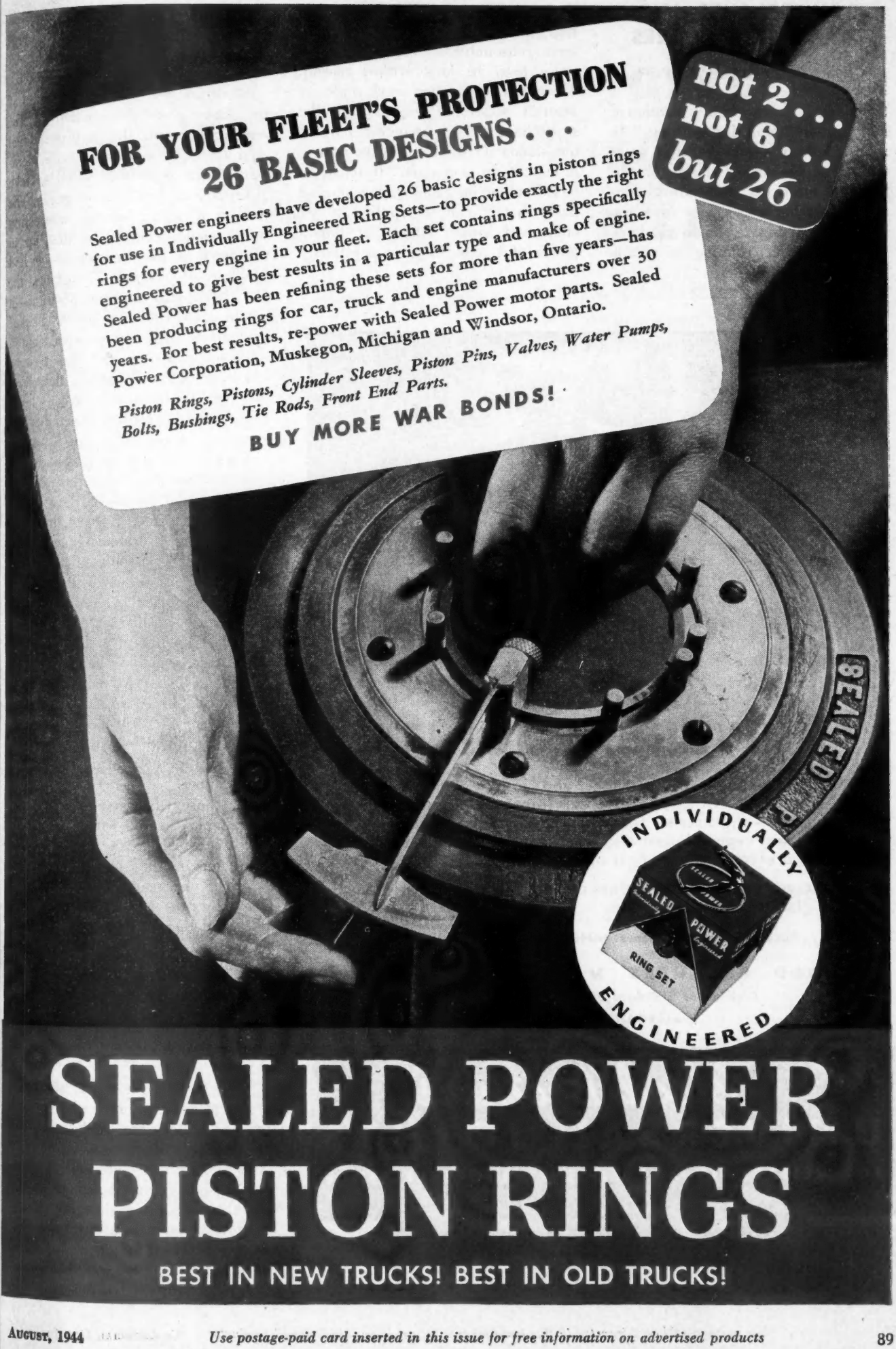
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26 BASIC DESIGNS . . .
Sealed Power engineers have developed 26 basic designs in piston rings for use in Individually Engineered Ring Sets—to provide exactly the right rings for every engine in your fleet. Each set contains rings specifically engineered to give best results in a particular type and make of engine. Sealed Power has been refining these sets for more than five years—has been producing rings for car, truck and engine manufacturers over 30 years. For best results, re-power with Sealed Power motor parts. Sealed Power Corporation, Muskegon, Michigan and Windsor, Ontario.
Piston Rings, Pistons, Cylinder Sleeves, Piston Pins, Valves, Water Pumps, Bolts, Bushings, Tie Rods, Front End Parts.
BUY MORE WAR BONDS!
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BEST IN NEW TRUCKS! BEST IN OLD TRUCKS!

POWERPLANTS AND TRANSMISSION LINES

(CONTINUED FROM PAGE 88)

tages that have been mentioned might easily stand for nothing. As a basic rule, it would certainly seem that a supercharged engine should not cost more per horsepower than an unsupercharged engine. Also, the supercharged engine should not have its supercharger running at speeds that are excessive and likely to cause high maintenance. It would also seem reasonable to expect that the noise level be kept within reason. There has been much work done on aircraft superchargers, but if the supercharger is to become a part of our standard equipment in the future, it cannot be a gadget. It must be based rather on the sound economic basis that it can be applied to an engine of lower weight per horsepower and reduced price per horsepower, and, yet, still give engine life within reasonable expectancy.

Types of Engines

Realizing that within the limits of the octane possibilities either type of engine can use the improved fuel characteristics, we come to consideration of the type best suited to take advantage of fuel improvements. The field is divided; but the interesting thing would seem to be that up to the start of the war when we had gasoline of around 77 octane, the "L" head had a firm position—it would haul 1000 or 10,000 lbs. of payload as cheap, or cheaper, in ton miles per gallon as any other type of gasoline engine. It seems, therefore, that the "L" head will have as large a spot in the future. Certainly up to compression ratios of 8 to 1, which are high enough for the immediate future—that future is probably tied in with supercharging—there seems no reason to discard the basic unit of integral crankcase and block design that is associated with "L" head type. All things considered, it is lower in price per lb, and it is stronger—both difficult things to get around if no urgent compelling reasons for change are lurking in the background. Service considerations, which used to be of such moment, are not likely to be a deciding factor if a determined effort is made to build in the metallurgical advances of our times.

For those who have felt that the replaceable head, with valves in place, is worth extra first cost, the future picture may change. Certainly, when one reads that "Mr. John Doakes" ran his vehicle 225,000 miles and then decided that perhaps he should do an overhaul job, the possibility of an engine being built, regardless of size, that will run say, 250,000 to 300,000 miles before major overhaul or renewal of any vital wearing parts, is an objective at which to shoot.

When we analyze, later, the component parts of engines, what is said will be against the background of that desirable attainment.

In further consideration of postwar gasoline engine design, it would seem that the air-cooled engine should be brought again into our review to see whether anything new has happened to it during the war that would

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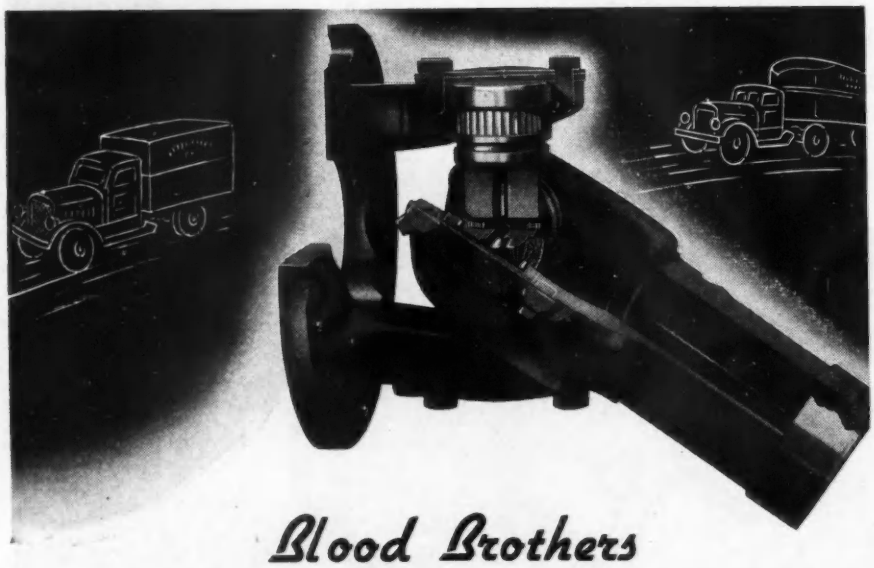

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You get reliable performance and long life when you specify Blood Brothers Universal Joints. All types for all purposes — engineered for smooth, efficient performance with many special features that make Blood Brothers Joints preferred among fleet operators.

Whatever your needs in joints our engineering department will gladly submit quotation.

Backed by over 30 years' factory and field experience

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SPECIFY *Blood Brothers*
UNIVERSAL JOINTS
FOR RELIABILITY AND ENGINEERING EXCELLENCE

GIVE *Horsepower* A LIFT!

● Get rid of sludge and gum—that steal precious horsepower.

Casite revives horsepower and performance, by cleaning out the motor, and by carrying lubrication to close-tolerance parts.

Remember: A clean motor runs better and lasts longer.

Use Casite summer and winter, for your entire fleet.

THE CASITE CORPORATION
HASTINGS, MICHIGAN

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CLEANS OUT MOTORS
KEEPS MOTORS CLEAN

★ *It's a Privilege to Buy War Bonds*

WHAT CASITE DOES

- It quickly cleans out harmful sludge deposits.
- Retards the formation of engine varnish.
- Frees sticking valves and rings.
- Makes starting easier—even in zero weather.
- Helps oil flow smoothly and constantly to close-tolerance areas.
- Gives better and smoother performance.

POWERPLANTS AND TRANSMISSION LINES

(CONTINUED FROM PAGE 90)

enable us to consider it as a possibility for general use in the truck field. The amazing performance in output that has been secured in aircraft air-cooled engines is obviously along the line of development that we hope for in truck engines. With an engine that produces a horsepower per cubic inch as a practicable possibility, it is easy to see what could be done were we able to afford such an engine in our vehicles. The absence of a cooling system with its ills is an additional attraction. The principal difficulty which sticks its head up in the truck field seems to be in the control of overall engine temperature. No known way has been yet developed that will, from a cost standpoint, permit consideration of automatic control of engine temperatures. Quite apart also from the inaccessibility that goes with an engine that must be shrouded to direct air for maximum cooling, sensitive regulation doesn't seem possible to a degree necessary in an engine as we know it in the water-cooled field. The price per horsepower at the present time is at least 10 times that of a good sound truck engine so the hurdles are pretty great in that direction. Weight saving and reduction of engine parts would seem to form the main attraction for consideration of air-cooled engines, but these reasons are not enough to outweigh the disadvantages that come with lack of temperature control. Finally, there seems no way to overcome the cost angle and the solution of the cab heating problem is not easily possible.

Better Bearings Certain

As to the component parts of engines, perhaps first we should put under the critical measuring glass the engine bearings—most of them being today the so-called precision type which have done so much to simplify our engine overhaul problems.

An examnation of various kinds of bearings used in aircraft, as well as bearings from lighter alloys, seems to indicate that the aluminum bearings hold a great deal of promise in many respects if we can find some way to keep them tight and, therefore, rattle-free when cold.

The art and knowledge of plating of bearings during this war has also increased to a point of where some of the bearing engineers foresee a very excellent future for a plated bearing. A 0.0005 of special plating on a bearing can apparently make all the difference between a 100,000 mile bearing and failure in a few thousand miles indicating that the texture of the finish alone created by the plating, as well as its uniformity, could be a factor in increasing bearing capacity.

In this connection it is interesting to note that the plating of alloys such as molybdenum, cobalt, etc., has left the experimental stage and offers the same kind of possibilities for uses not thought of until scarcity of these alloys prompted their research.

The plated silver bearing seems to be one offering the great promise in connection with load carrying rating, but at the moment no way is seen to produce this bearing short

(TURN TO PAGE 94, PLEASE)

Which Watch Would YOU Choose?

There is very little difference in the outward appearance of these two watches. Yet—one has been made and assembled with consummate skill to withstand extreme altitudes, severe shock and rapid climatic changes. You can risk your life on its accuracy.

Consider carefully these two watches, then give the lie to anyone who says there isn't a difference in brake linings. Other brake linings may *look* like GRAFILD, but—GRAFILD is made much like a fine watch, with the same precision, the same painstaking care, the same determination to produce a better product.

Your LIFE May Not DEPEND on the BRAKE LINING You SELL, BUT YOUR BUSINESS DOES!

GRAFILD *Brake Linings*

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THIS IS IT.... the NEW OILDEX

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(OIL DILUTION EXTRACTOR)

THAT HAS CREATED SO MUCH FAVORABLE COMMENT AMONG FLEET OWNERS IN THE PAST 2 MONTHS!

Replaceable Vapor Filter →

The problems caused by crankcase sludge, water, acid and dilution are receiving more serious attention today than at any time in automobile history. The reason is *very* evident. — Motors must last longer. OILDEX is needed because OILDEX attacks the dilution problem by removing the trouble-causing diluents *and sending them back to the motor as extra fuel.*

OIL SAVED—GAS SAVED—REPAIRS REDUCED *with* OILDEX

Actual operation of OILDEX on many types of motors has proved the following improvements are achieved:

- Removal of water, acid, gasoline and other liquid diluents from the crankcase
- Detection of leaky or porous blocks & blown gaskets
- Restriction of sludge formation, Crankcase Varnish, carbon residue
- Decreased carbon formation, resulting in longer intervals between carbon and valve jobs
- Greater gasoline mileage
- Viscosity of the oil maintained for as much as 50,000 miles
- Better lubrication and better oil mileage
- Better piston seal and freer valve action
- Continuous automatic upper engine lubrication
- Improved crankcase ventilation

OILDEX receives its suction power from the intake manifold. Its powerful vacuum sucks out water vapor, oil vapor, gasoline vapor, acid and other vapors that otherwise condense in the crankcase and valve assembly compartments. These vapors are then filtered and cleaned, passed through the OILDEX automatic volumetric control valve, and returned to the motor as extra fuel! Conventional ventilating systems and breather pipes have little effectiveness at speeds under 30 miles per hour—OILDEX operates with efficiency at all speeds—low or high. Fitting Sets for OILDEX and FILTREX for all makes of cars, trucks, busses, tractors, marine and stationary gasoline engines available. Specify model when ordering.

OILDEX lists at $15 complete with fittings (slightly higher on West Coast).

QUICKLY AND EASILY INSTALLED. CONTACT YOUR LOCAL JOBBER — OR WRITE US FOR FURTHER DETAILS.

Eastern Seaboard Distributor
GENERAL MOTIVE PARTS COMPANY
61 Amsterdam Ave., N. Y. 23, N. Y.

Some Territories Still Open for Zone Distributors! WIRE or WRITE.

FILTREX — The Perfect Supplement To OILDEX

Pat. No. 2,108,218 other Pats. Pending, Trade Mark

Oil does not wear out; it becomes unfit for safe lubrication because of harmful solid and liquid diluents. Remove these harmful diluents with OILDEX and FILTREX for Economy and Protection!

FILTREX ADVANTAGES:

- Light—Compact—Strong
- Series of different densities of filtering elements
- Partially balanced method of filtration
- Large inlet opening permits free FLOW of dirty oil, eliminating danger of clogging at this point
- All dirt collected is removed when replacing filter bag
- Filter Bag easily changed
- Low cost of replacements

MOTOR ECONOMY PRODUCTS, INC.

DIVISION OF WATSON ELEVATOR COMPANY, INC.

407 WEST 36th STREET NEW YORK, 18, N.Y.

POWERPLANTS AND TRANSMISSION LINES

(CONTINUED FROM PAGE 92)

of probably three times the cost that is now paid for the best copper-lead bearing. It is stated, however, that the silver bearing would permit extended life of the crankshaft and, therefore, the optimistic side is that such bearings can be used for mileages greatly in excess of what is now accepted as reasonable. Silver bearings will not be out of the picture if they give the same per mile cost that copper-lead now gives.

For truck purposes the babbitt bearings are gone, and it seems now that the copper-lead bearing is also due for changes if it is to maintain its present position of popularity. The expected type will be steel-backed with perhaps 0.015 of copper-lead finely divided and a final plating of .0005—in other words, a tri-metal type.

Other parts of the engine to consider, if our bearing picture becomes so favorable, are valves, pistons and rings.

The Piston Picture

We automatically assume that whatever metal is used in the future in pistons in truck engines, it must first be light as now used, and that seems to bring aluminum to the forefront as being the only light alloy with sufficient strength and with sufficient low cost to warrant further development. One defect of the aluminum piston lies in tendency to scuff at low temperatures, but in fairness, it should be said that iron pistons have the same trouble. Wear of the ring slots seems reasonable but plating may be necessary if considerably extended life is expected in line with engine bearings. Alloys which will permit forgings at a comparable price to aluminum casting of pistons may help this situation as well as further reduce weight, but much has to be done if we are to consider higher outputs and longer life. So far the steel picture has not developed in any way to give us any hope for light steel pistons in our truck engines in the future.

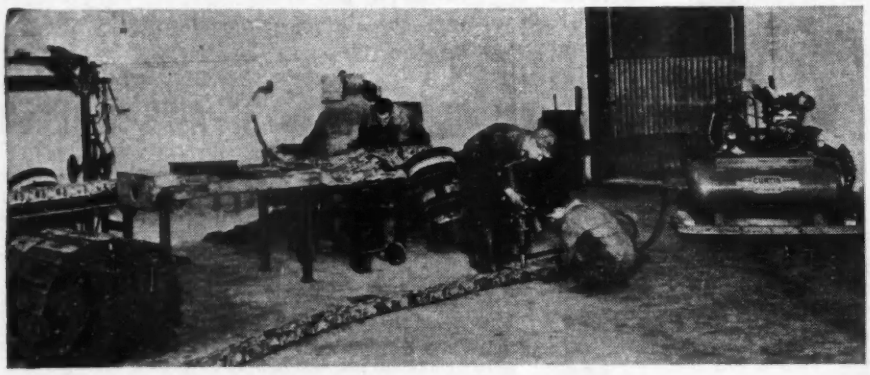
Ring Research Promising

Piston rings, having received the most intensive study and research up to date because of aircraft needs, indicate certain lines of development, and we have a right to expect that our rings of the future be indefinitely proof against combustion temperatures, breakage and able to stand unintentional neglect of dirt control. Iron of greater strength to the greater temperature changes possible with future truck engines will have to be used, and any form of chrome treatment will give added insurance against a small amount of uncontrolled dirt. It seems that chrome of itself in a clean atmosphere does not add to life. The new rings will cost more but last longer and in per mile cost, it is believed, will fully justify the added cost. At this juncture it should be said that operating temperatures will be higher as it seems reasonable to have closed cooling systems with perhaps 10 lb.-15 lb. pressure.

The View on Valves

Valves are of vital importance in any design but with our desire for

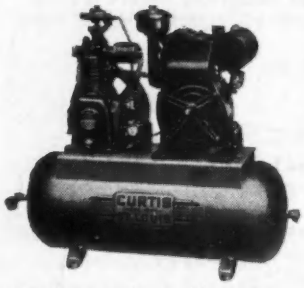
(TURN TO PAGE 96, PLEASE)



Air Tools Powered by

CURTIS COMPRESSOR

Cut Labor Time Two-Thirds!



Gasoline Engine Powered Compressor

Illustrated above is a Curtis Air Compressor installed in the repair shops of the E. F. Craven Company, Greensboro, N. C. It is used to power such tools as an air wrench and to furnish air to spray guns used in painting heavy construction equipment. Mr. E. B. Moore of the Craven Company states:

"When using the air wrench and Curtis Compressor we can remove and install grousers on tractor tracks in about *a third of the time it would take to do it by hand.*"

The chances are there are many jobs in your shop that can be done faster, cheaper, and better when using air tools powered by dependable, economical Curtis Air Compressors. Thousands of firms have relied on Curtis Compressors for many years to deliver an adequate supply of low-cost air with a minimum of maintenance expense throughout an exceptionally long compressor life.

Curtis engineering advantages include Tapered Roller bearings, centro-ring lubrication, centrifugal unloader, carbon-free disc valves, V-belt drive, precision workmanship. Sizes up to 10 H. P.

It will pay you to investigate all the time-proven advantages of Curtis Compressors. Write for information on prices and priority rating available.

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● Please send me further details concerning Curtis Air Compressors.

Name.....
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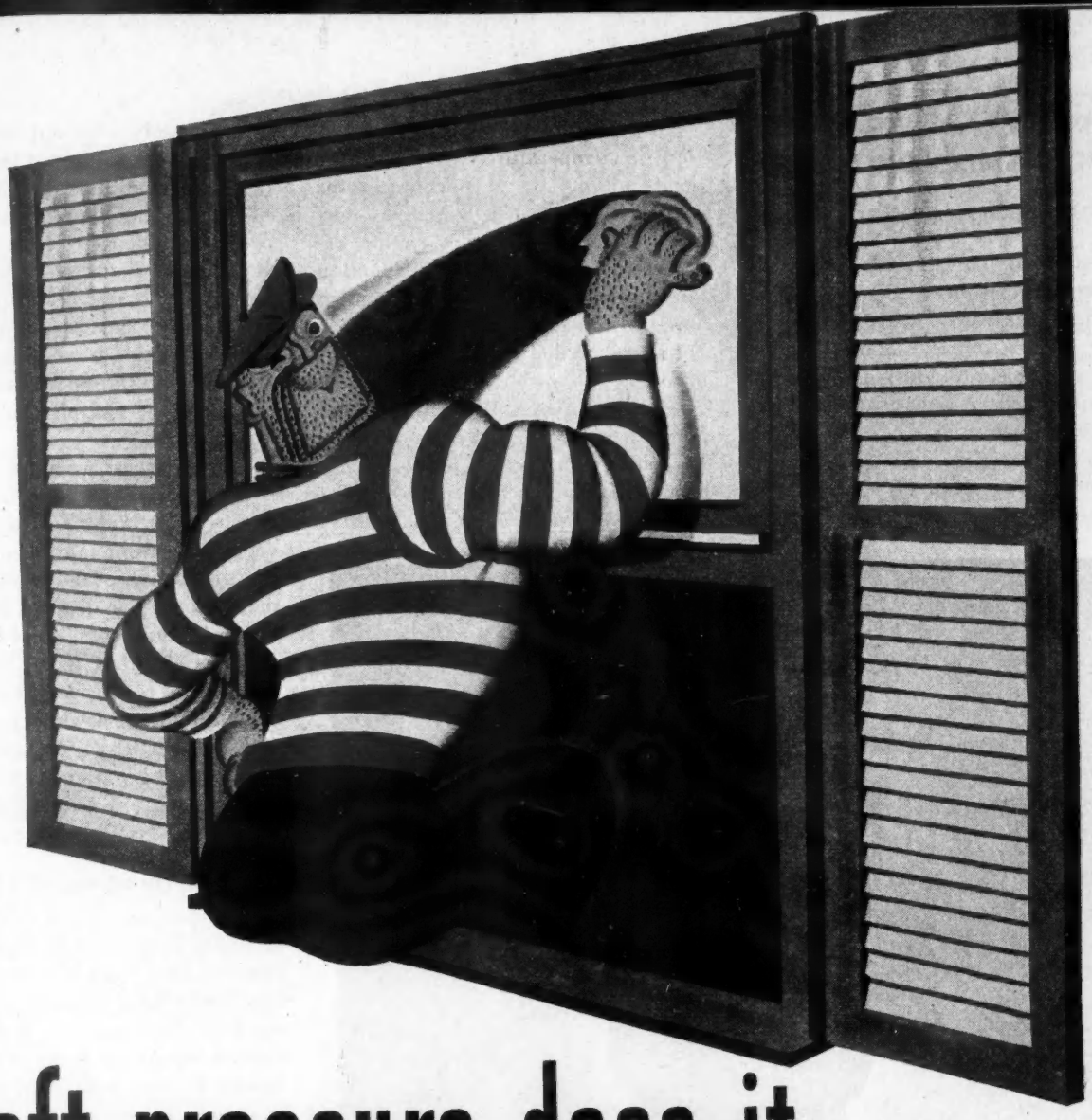

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★ *IT'S A PRIVILEGE TO BUY WAR BONDS*

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HASTINGS STEEL-VENT
PISTON RINGS

U. S. PAT. 2,148,997

TOUGH ON OIL-PUMPING **GENTLE** ON CYLINDER WALLS

(CONTINUED FROM PAGE 94)

increased engine stability, they could be the Achilles heel. In addition to the increased work valves must do in these higher output engines of the future, we have to consider the effect of our efforts to run on the leanest possible mixture.

One of the principal valve manufacturers has this to say:

"In many instances a slight reduction in temperature will pay dividends all out of proportion to the investment and it will be of a decided advantage for the engine designer to give considerable attention to the importance of careful detail in an effort to keep valve operating temperatures at the lowest possible figure.

"There is a tremendous amount of research being carried on to develop materials with better physical properties at the elevated temperatures and certainly it is not beyond one's imagination to feel that the results of these investigations will be available to engine manufacturers when the need for military secrecy is removed. It is very doubtful, however, that there will be any need for materials far beyond the capabilities of the present existing ones, providing serious attempts are made to maintain temperatures within reasonable figures.

"Development work on such items as seat inserts designed to offset the effect of cylinder distortion, free-valves to permit movement during a certain portion of the cycle to reduce the tendency for deposits to build up locally, should come into the picture.

"It is felt that if the items mentioned can be carried through to a conclusion, the valve performance and life will in no way be impaired by operating engines with higher outputs than are utilized at the present time."

The Question of Liners

We come now to a consideration of liners in the truck engine of the future. The liner theory seems to have had a fatal fascination to everyone in the past—it having had enough attraction as to cause all designers to play with it at some time or other. The larger the engine, the worse the problem seems, and it makes no difference whether it is wet liners or dry liners. On one hand, the picture is drawn of the desirability of hard material in the cylinder bores, but actually it now seems uniformity is more important. One hears of recent experiments which indicate that high mileages can be secured with brinnels as low as 220. The net result seems to be that we are just as far off from being able to accurately assess what a liner means to the operator as we were some years ago. The economics are just as cloudy as they have always been and just now nothing looms for the future that helps to make this picture any clearer. For a liner to be of any value in the past and handled by the operator as a service item, it had to have a minimum thickness that, in turn, made the ultimate combined wall thickness of liner and block, in case of a dry liner, bad from the standpoint of surface heat. The wet liner has its obvious dis-

(TURN TO PAGE 98, PLEASE)

PAR MODEL V-51

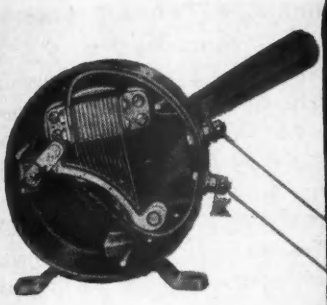
- Just the ticket for premium space. Requires only 20" square floor space.
- Single stage—2 cylinder compressor designed for use of tire pumping and other small air operations.
- Available in either vertical or horizontal models.

- Write for illustrated brochure of details.
- BY COMPARISON—YOU'LL BUY PAR.

PAR DIVISION

LYNCH MANUFACTURING CORPORATION

DEFIANCE, OHIO, U. S. A.



Why Warner Electric Brakes Give You SPLIT-SECOND STOPPING POWER FOR YOUR HEAVY LOADS

—USE LESS CURRENT THAN A TAIL LIGHT!

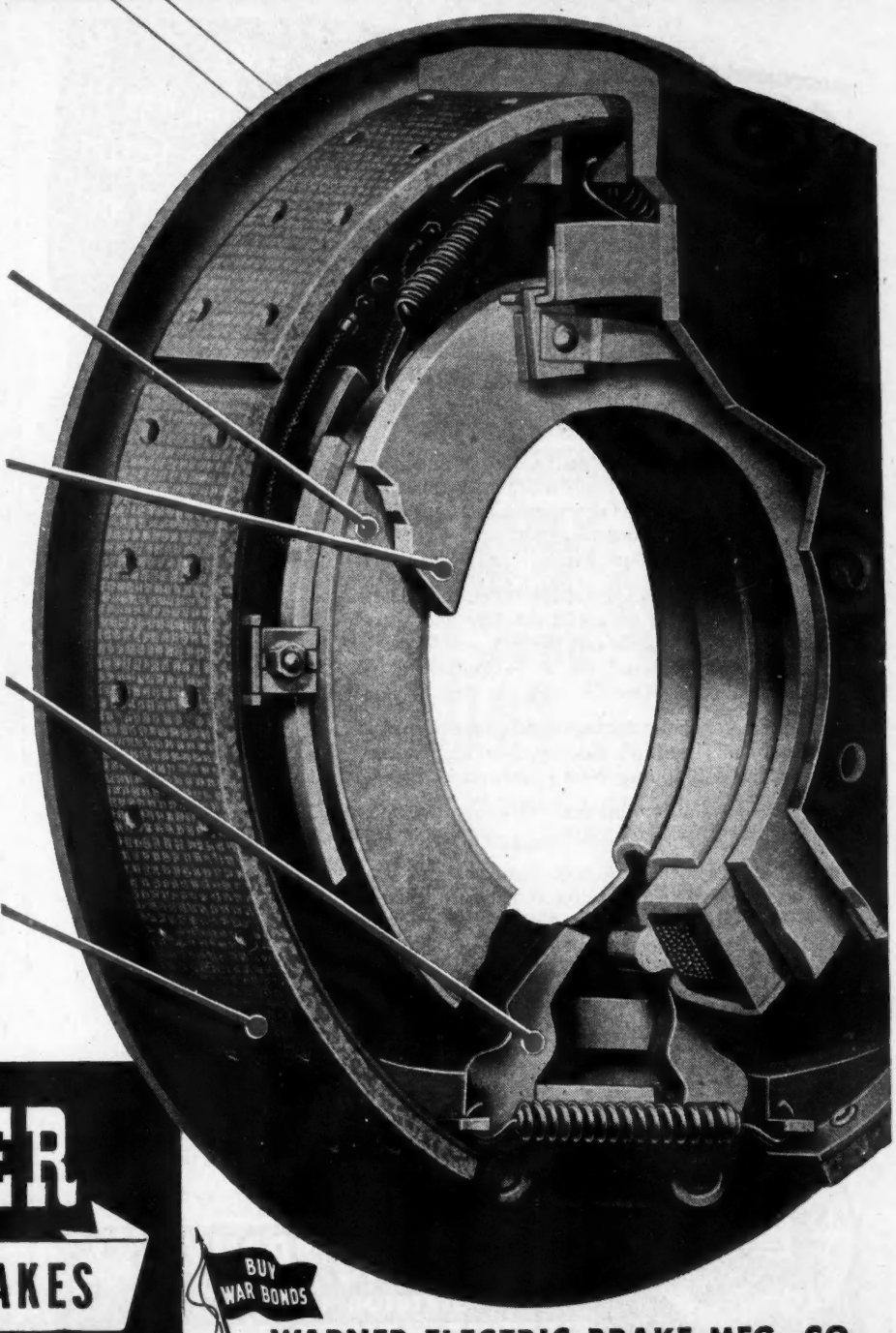
• The Warner Electric Brake is a simple, mechanical brake, operated by an electro-magnet and armature disc. Each wheel is a complete brake unit. The power is built within the brake itself — a wire to the battery and a rheostat control are all that is needed to operate the brakes.

• The electro-magnet remains stationary within the wheel, until power is applied from the driver's seat.

• The armature disc revolves with the wheel. When the driver moves the controller lever the electric current energizes the electro-magnet causing it to cling to the revolving armature disc which shifts the magnet within a limited arc in the same direction as the wheel.

• As the electro-magnet shifts, a lug attached to the magnet presses a cam against the brake band end, forcing the brake band against the drum thus applying the brake.

• The more current the driver allows to reach the electro-magnet the tighter it clings to the armature disc. A slight slipping action prevents grabbing. No brake adjustment is necessary. Lining can be worn down to rivet heads — at which point a safety stop eliminates scoring of drums.



WARNER

ELECTRIC BRAKES

BUY WAR BONDS

WARNER ELECTRIC BRAKE MFG. CO.

BELOIT, WISCONSIN

POWERPLANTS AND TRANSMISSION LINES

(CONTINUED FROM PAGE 96)

advantages, and unless there is such a big gain as would come from a large savings in operating cost, the liner still remains just about where it was 10 years ago. The life of cylinder blocks properly alloyed and well designed to maintain roundness of cylinder bores, with good heat control and proper lubrication, and with well-maintained air cleaners, can have a potentiality of a half million miles before the maximum oversize piston has been used. Perhaps we had better stay put until further progress is made. It would certainly be desirable from a cost standpoint, as well as maintenance in the field, not to have to use liners. If, however, we can use very thin liners, and if they are always removed and new ones inserted under strictly controlled conditions, then the future holds promise.

Automatic Transmissions

It seems reasonably true that in post-war cars, automatic transmissions will be freely offered and they may be of the hydraulic type, torque converter type, and straight mechanical type. In the general commercial truck field, much of what we do with transmissions will depend on highway development as well as the possible economy, if any, with automatic transmissions in long distance operation. In the heavy-duty truck field it hardly seems feasible to have several designs of automatic transmissions as optional equipment as the cost of same may be prohibitive. The much discussed factor of decreased maintenance, if some hydraulic means of actuation is used, is still one of the intangibles and has to be evaluated. In the bus field there seems to be no question that the automatic transmission is a must. In over-the-road service there is no reason to have a transmission to relieve driver strain and, therefore, overall economy in fuel consumption, as well as maintenance, must be the prime requisites for its inclusion. If we see the development in this country of super highways similar to those already started in the East between Pittsburgh, Washington and New York, then the question of transmission for over-the-road trucks becomes relatively simple.

The basic requirements for automatic transmissions are:

1. Elimination of manual operation of the clutch.
2. Elimination of manual operation of gear shift lever.
3. If gear steps are retained, the shifting to take place automatically at the correct time under all conditions.
4. The engine must be available for braking.
5. The driver should have a certain amount of over-ruling power.
6. This over-ruling power should not require any buttons or levers.
7. Transmission should be simple.
8. No special service problems should arise.

Various approaches are possible to satisfy these conditions. The three major ones being: (1) mechanical automatic transmission including automatic friction clutch; (2) hydraulic coupling plus automatic mechanical transmission with or without

(TURN TO PAGE 100, PLEASE)

ANTHONY LIFT GATE HYDRAULIC

CAPACITIES 1000 LBS. TO 1500 LBS.

"A LABOR SAVER"
"TAKES PLACE OF EXTRA MAN"
"HAS MORE THAN PAID FOR ITSELF"
"DAMAGE CLAIMS PRACTICALLY NIL"

MOUNTS ON TRUCKS NOW IN SERVICE OR ON NEW TRUCKS

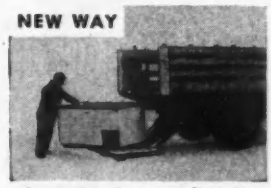
ONE MAN now does the work of THREE

- "We can recommend this Loader to anyone, as they certainly are not only a labor saver, but they also protect the steel drums which are very hard to secure. We are ordering another."—The R. J. Brown Co., St. Louis, Mo.
- "The Lift Gate has definitely taken the place of an extra man; if we could not buy another we would not part with our present one for many times what we paid for it."—Continental Oil Co., Louisville, Ky.
- "Our merchandise damage claims have been practically nil."—M. F. Rockey, Moving, Storage, Packing & Shipping, New Cumberland, Pa.
- "Best possible testimonial—ordering two more next week."—Springfield, Ill.
- "This equipment has more than paid for itself since purchased, and we recommend the installation of such equipment on all trucks where loads of 150 lbs. or over are handled."—Bakelite Corporation, Bloomfield, N. Y.

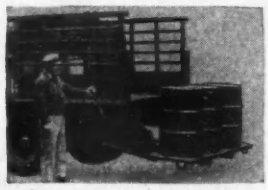
A PARTIAL LIST OF OTHER USERS

Socony Vacuum, Coca Cola, Standard Oil, E. I. DuPont deNemours, and a list of other users, like the Union Pacific Railroad, are enthusiastic operators of the Lift Gate Loader.

3 men required to load truck.



1 man slides heavy cooler onto lowered LIFT GATE.


1 man operates lever to raise 3 heavy oil drums.

1 man easily loads barrels from raised LIFT GATE.

ANTHONY'S ZB PLATFORM HOIST—Makes Inexpensive dump body out of platform, stake or grain body.

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Controlled Heat Zone SPARK PLUGS

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The Vital Impulse that Sparks the Engines of War

STAMINA is one of the outstanding qualities we build into every BLUE CROWN Spark Plug. BLUE CROWNS are long on precision, efficiency and all-out performance. They have what it takes for the long haul. On the fighting fronts overseas and at home BLUE CROWNS "deliver the goods"...they stand up under fire and operate dependably where the going is toughest.

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POWERPLANTS AND TRANSMISSION LINES

(CONTINUED FROM PAGE 98)

automatic friction clutch; (3) hydraulic torque converter with or without auxiliary automatic transmission.

In selecting the proper basic design, it should be borne in mind to try to obtain as many other advantages as possible. For buses or trucks where clutch wear has been an important service problem, it would be highly desirable to eliminate this completely. The best way to do this is, of course, by eliminating the friction clutch altogether. This could be done by adopting the hydraulic coupling with an automatic transmission and omitting any friction clutch. The mechanical transmission in this case would have to have the same number of gear steps as the mechanical automatic transmission.

In general, automatic transmissions are somewhat more expensive than the standard transmission. This added cost is partly caused by the required automatic controls. By reducing the number of gear steps, the controls can be simplified. The ultimate aim, of course, is to omit gear steps altogether. The above-mentioned two types of automatic transmission do not offer this possibility.

One way to eliminate or reduce the number of gear steps is offered by the hydraulic torque converter, the development of which has made substantial progress during the last years.

Obviously, the efficiency of a hydraulic torque converter adopted for propulsion of automatic vehicles is of the utmost importance. It is also of extreme importance that a sufficient torque ratio be provided so that the vehicle can move its maximum load under all conditions. Unfortunately the characteristics of a torque converter are such that if it is desired to have a high torque ratio, the efficiency curve suffers accordingly. For that reason a certain happy medium must be struck and for buses and trucks it will be generally found that if it is desired to obtain a high efficiency, the torque ratio which can be obtained under these circumstances is not sufficient to propel the vehicle. It is, therefore, desirable to make up the loss of this torque ratio by introducing an auxiliary transmission in back of the converter.

The controls for this type of transmission are of the utmost importance. Since a torque converter has a variable efficiency, the controls should be of a type which tend to produce maximum efficiency of the drive at all times under all conditions. Developments are well under way and promise to result in a drive of great flexibility, relative simplicity in construction and utmost simplicity of operation.

If it should be some long time before the development materializes for the truck field, we may find designs using synchromesh units as a means to simplify gear shifting. Because of patent restrictions, the cost of such transmissions is high and it is questionable whether the overall life of the synchromesh transmission with a good driver would be extended over an orthodox version to make the complication of weight, etc., worthwhile.

(TURN TO PAGE 102, PLEASE)

A tiny crack hold up a truck?

NOT IF YOU USE K&W METALLIC SEAL

THESE DAYS it's important to keep vital equipment on the job.

Now—cracked blocks and heads in buses, trucks, tractors and diesels can be restored to service—guaranteed results or your money back—in a matter of minutes!

Thousands of Fleet Owners know that K&W Metallic Seal will *permanently* repair cracks in blocks or heads *except* where crack or break is too large to be fixed by any other than mechanical means.

Just pour a pint can in the radiator. No need to remove thermostats or top hose. K&W Metallic Seal won't clog or stick—except in the crack. Presto, the job is done and these tiny cracks sealed—forever! See your K&W Jobber.

NOTE—Badly cracked or otherwise damaged blocks and heads can be quickly restored to service by the K & W Mechanical Method in a surprisingly short time at a price far less than replacement cost. Every job is guaranteed for the life of the motor. K & W Service Kits, containing all necessary repair materials, sell as low as $57.50. Service available through K & W Licensed Repair Stations located all over the country.

K&W Radiator Seal
Stops radiator leaks. Costs a little more—worth a lot more. Try it too!

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K&W METALLIC SEAL
K&W MECHANICAL METHOD
GUARANTEED BLOCK AND HEAD REPAIRS

HARNESS THE MAGIC POWER OF AIR!

WITH THE NEW

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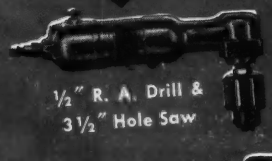
AIR TOOLS

7 COMPLETE TOOLS IN 1 COMPACT KIT

¼" Drill



½" R. A. Drill & 3½" Hole Saw

6" Grinder and Wire-Wheel Brush

2-in-1 Sander & Polisher

Each of these Thor Multi-Matic Air Tools is available as a unit. Parts to assemble all tools are in the complete Multi-Matic Kit.

Actually do more work Faster—at less cost

NOW, get for your shop the advantages of small size, light weight and tremendous power that have made air tools preferred on factory production lines for years. Get greater performance and lower maintenance cost with these simple, easy-to-handle Thor Multi-Matic Air Tools that run on air from a compressor as small as 1½ horsepower.

The complete Thor Multi-Matic Kit consists of a small, powerful air motor with interchangeable attachments for drilling, grinding, sanding and polishing.

THOR PORTABLE ELECTRIC TOOLS have exclusive features of design and construction that provide unequalled performance efficiency. A complete line of electric drills, grinders, sanders and polishers for all light and heavy duty automotive service.

REPAIR THE CARS WITH THE TOOLS THAT BUILT THEM

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Company_____

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City_____ State_____

POWERPLANTS AND TRANSMISSION LINES

(CONTINUED FROM PAGE 100)

Axle Battle Looms

At the present time, the truck field is generally supplied with axles of a reasonably common design. With three kinds, viz., single reduction, double reduction, and two-speed axles, we have been able to develop satisfactory designs from the point of view of life in relation to the rest of the vehicle. In fact, in most cases the rear axle maintenance is a surprisingly low one in relation to other units.

It seems very likely that even with our existing spiral bevel gear designs new methods of heat treatment and a better understanding of gear tooth generation will result in much longer life. In any case, it seems that we are due to see a skirmish, or maybe a real battle, between a design similar to those now current, and the hypoid gear type. On paper the increased pinion size, which seems possible with the hypoid gear set of the same size as the spiral bevel set, is very attractive, but the resultant problems that attend the change in pressure angles and other things peculiar to the hypoid are still factors that have to be reckoned with in the ultimate running cost.

END

(Please resume your reading on P. 63)

A LITTLE DOES A LOT

All-purpose Mobo Auto Soap goes a long way—cleans wheels, chassis and running gear as well as body. Does it fast and economically.

Mobo lathers instantly in hot or cold water. Rinses off easily and leaves no streaks. 35 years the favorite with fleet washers, it's made today, as always with 100% vegetable oils—won't injure finishes even in daily washing. Try some now.

MOBO AUTO SOAP

FOR SAFE, SPEEDY DEGREASING

Dissolve grease, oil, and grime instantly from motors, chassis and running gear with Mobo Degreasing Fluid.

Safer, and far superior to gasoline, Mobo degreases swiftly, leaves no greasy film.

MOBO DEGREASING FLUID

JOHN T. STANLEY CO., INC., 642 West 30th St., New York, N. Y.

CAUSES AND CURES OF COOLING TROUBLES

(CONTINUED FROM PAGE 45)

mined by the rusty condition of the coolant. To remove adherent rust from the water jacket and radiator, rust-solvent cleaning preparations of the sodium bisulphate or oxalic acid type are necessary. Without the use of such a cleaner, pressure flushing, requiring partial disassembly of the cooling system, is a waste of time and money, since flushing can only remove the loose deposits. Alkali cleaning materials have no dissolving action on rust and, therefore, will not remove hard, adherent scale. Judging from some current literature on cooling system cleaning, this fact should be more generally known. Acid cleaning should always be followed with a neutralizer solution to end all action of any undrained cleaner.

Cooling system cleaning on the chassis may not be effective if the radiator is left uncovered during the cleaning operation. Because of low heat output with the engine running without load, the thermostat valve may remain partly closed, and in cool weather may cut off practically all flow of cleaning solution through the radiator. This applies particularly to systems with coolant bypasses.

Cleaning vs. Rust Prevention

To put off the need for cleaning as long as possible, cooling system deposits should be kept down to a minimum. This can be assured only by maintaining full strength corrosion protection with water, and by using properly inhibited anti-freeze, replacing both when a rusty condition of coolant indicates inhibitor exhaustion. Disregarding the benefits

(TURN TO PAGE 105, PLEASE)

CAUSES AND CURES OF COOLING TROUBLES

(CONTINUED FROM PAGE 102)

of maintaining full cooling efficiency, there should be no question about the cost of rust prevention as compared to cleaning. Even the simplest preventive cleaning procedure involves the expense of cleaning material, engine fuel and usually more than one hour's time. On the other hand, a small dose of inexpensive rust preventive added to water, which will retard the normal rusting action of water 95 per cent, takes only a minute to install.

Corrosion Damage

To the 14 per cent of cooling failures caused by rust clogging, add another 4 per cent for replacement or repair of expensive parts damaged by corrosion, and we have a total of more than 18 per cent of all failures that may be charged, in part at least, to neglect of rust prevention. Thermostat failure, contributing another 2½ per cent, can be caused by embrittlement or perforation of the actuating unit by corrosion.

External & Internal Leakage

Neglected leakage was discovered in over 45 per cent of the investigated failures. Over half of the leakage points were external and could have been observed. The radiator, water pump shaft, hose, and water jacket joints all ranked uniformly high in leakage. Prevention of coolant loss and shortage from external leakage can be avoided only by the regular practice of leakage inspection and, equally important, by the prompt correction of leakage in the early stages. How often leakage inspection should be made, will depend on the particular cooling system and the type of vehicle service.

Leakage of Head Joint

Field investigation uncovered internal leakage of the water jacket in 20 per cent of the total failures, divided three-fourths to combustion gas leakage into the cooling system and one-fourth to coolant leakage into the engine. Defective cylinder head joints accounted for most of the internal leakage, although cracked heads and blocks contributed about one-sixth of the total water jacket leakage. Internal leakage is more difficult to detect, and generally more dangerous.

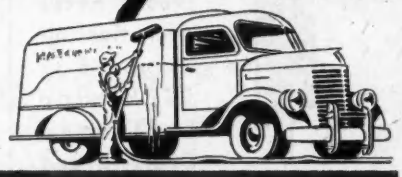
A practical test for internal leakage of the water jacket can be made without any special tools, by the following procedure: (1) Disconnect the pump drive, (2) open the cylinder head coolant outlet, (3) remove thermostat, (4) pour water in the radiator until water jacket overflows, and (5) with the engine running, watch for bubbles or rise of coolant in the outlet opening, before boiling starts.

Although torque may not always be a dependable guide to cylinder-head bolt tension, because of variations in thread and abutment friction, the value of a torque indicating wrench as a visual check on the mechanic's ability to "feel" the tightness of a bolt or nut, in our opinion, cannot be denied. In a test of 150 mechanics, to determine the dependability of their sense of feel for uniform tightening of cylinder head bolts, each man was given the opportunity, with an ordinary wrench, to

(TURN TO NEXT PAGE, PLEASE)

SPEED WASH
FOUNTAIN BRUSH

Cuts Washing Time in Half



Washing trucks and trailers with Speed Wash gets amazing results with little effort and great speed. Clean, fresh water feeds right through the handle and tufts, so that each 12 inch stroke does a complete job of soaking, scrubbing and rinsing. There's no waste motion changing tools and back-tracking over the same surface. You can see how this easily cuts washing work and time in half, does a better job, and also saves the finish.

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Put Speed Wash to work on your trucks. If it doesn't measure up to your expectations, return it for a full refund of your money. Order on this liberal basis today. Extend your priority of AA-5 or better, to insure prompt shipment. Make out your check or money order to Milwaukee Dustless Brush Co.

9.45 post paid if check accompanies order.

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Milwaukee Dustless
BRUSH COMPANY
526 NORTH 22nd STREET, MILWAUKEE 3, WISCONSIN

CAUSES AND CURES OF COOLING TROUBLES

(CONTINUED FROM PAGE 105)

tighten five bolts to 50 foot-pounds, as recommended for the particular engine. A check of the mechanics' sense of feel, with a torque indicating wrench, revealed a variation in torque from 240 per cent on the high side to 50 per cent on the low side. Best tightening results with the mechanic's favorite wrench showed a difference of 14 foot pounds between high and low readings.

Water Pump Leakage

Water pump shaft leakage, accounting for one failure in every 16, will permit air to be drawn into the coolant at higher pump speeds. Excessive aeration of coolant can increase rusting of iron as much as 30 times. Slight chronic leakage of the water pump shaft seal and the cylinder head joint go hand in hand with corrosion and rust clogging. Air suction into the system at any loose joint on the low pressure side of the pump including the shaft seal, also can cause coolant overflow and overheating.

Air suction and combustion gas leakage tests should be made whenever overflow losses cannot be explained, or when the coolant becomes rusty in a comparatively short period of time. To test for air suction into the system, attach a rubber tube to the overflow pipe and insert the free end of the tube in a bottle of water. With the engine running at safe high speed, and with the coolant temperature stabilized, look for air bubbles in the bottle. In the absence of combustion gas leakage, air suction into the system will be indicated by a stream of air bubbles in the bottle.

Hose Connection Leakage

Going back to the tabulation, it will be noted that nearly 7 per cent of the total failures were chargeable to defective hose connections. Two-thirds of all hose leakage were caused by loose clamps, and one-third by failure of the hose itself. Some of the hose leakage might be attributed to the mechanic's failure to tighten clamps following installation of ethylene glycol solution. With a little looseness already existing in the clamp, a water-soaked hose lining may shrink slightly in the loose joint, following the anti-freeze installation, and possibly cause more leakage.

To investigate the problem of cooling system hose deterioration, a laboratory test was made in 1939 of 101 different brands and grades of radiator and heater hose. Short sections from each hose sample were connected together with pipe nipples and clamps to form a circulating system. In a number of duplicate systems, water and various anti-freeze solutios were heated to 160 deg. and circulated in a manner simulating cooling system operation until failure from leakage or clogging took place. The test established that hose failures were primarily related to composition and fabrication and not to type of coolant used, also that indiscriminate selection of hose without regard to serviceability in the cooling system can result in a wide variation in service life between different grades, which can fool a mechanic badly if

(TURN TO PAGE 108, PLEASE)

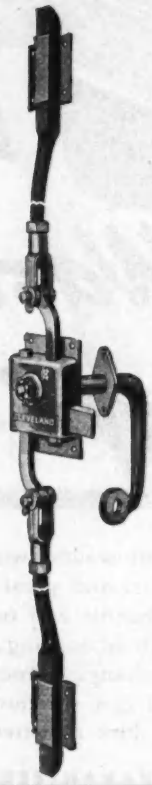
"Cleveland"

Unfailing performance year after year has given "CLEVELAND" DOOR LOCKS and DOOR CHECKS a wide reputation for dependable service. Drivers, service men, builders and owners recognize their superiority.

No. 2385
The Wedge
DORLOK

Provided for medium sized bodies. Easy action, rattle-proof. Keeps doors tight always. For Right and Left Hand Doors—2 and 3-way.

• Today "Cleveland" Drop Forgings cover every item used in the Defense Program.



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Made with heavy, round adjustable rods. A durable spring prevents road shock from jarring lock open.

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Send for catalog 22 B 1 covering the "Cleveland" stock line of Truck Body Forgings . . or catalog 18A covering "Cleveland" Automobile Forgings.

OVERHEAD DOOR CHECKS

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Slide Rod Is Bolted to Door and Swing Rod to Head Sill

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Let Mr. Kramer tell you . . . "As fast as we can bring in a trailer outfit, the tractor is turned over to another crew and load. In meeting war transportation needs, tractors and batteries get no rest. We know that Auto-Lite batteries won't let us down. They always seem to have that extra power to carry us through any emergency. Auto-Lite batteries stand the gaff."

When you replace the batteries in your fleet, install dependable, economical Auto-Lite batteries made with "Activite" and Fibre-Glass, they outlast ordinary batteries two to one in tests conducted according to S.A.E. standards.

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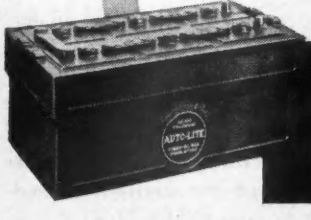

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TUNE IN AUTO-LITE'S RADIO SHOW "EVERYTHING FOR THE BOYS"—TUESDAY NIGHT—NBC NETWORK

CAUSES AND CURES OF COOLING TROUBLES

(CONTINUED FROM PAGE 106)

he neglects inside inspection of hose connection.

Radiator Leakage

Radiator and hot water heater leakage accounted for over 8 per cent of the total cooling failures. Over seven-eighths of the leaks were found in the metal seams and joints of the core, tanks and connections, and less than one-eighth were caused by corrosion perforation or breakage of metal in the water passages of the core. Corrosion inhibitors help to reduce both types of failures by retarding embrittlement of the metal and subsequent breakage by temperature stress, shock and vibration.

Leakage of Jacket Joints

Outside leakage of the water jacket caused over 4 per cent of the failures. One-fourth of the water jacket leaks were found in the thermostat housing joint, which is often subjected to excessive strain and vibration. The other three-fourths of the jacket leaks were found at the cover plate, drain closure, pump housing joint, cylinder head studs and oil lines. Pumping pressure and stress from wide temperature variations in the engine, especially during cold weather, aggravate water jacket leakage. Suitable non-hardening gasket cement in water joints will reduce the corrosion and leakage tendency, and also facilitate removal of the part.

Insufficient Anti-Freeze

Cooling failures associated with freeze-ups accounted for nearly 13 per cent of the total. Although a protection table is furnished with standard anti-freeze products, and cooling system capacity data are made available by vehicle manufacturers, investigation revealed that insufficient protection had been installed in two-thirds of the freeze-up cases. In the other one-third, inaccurate testing of anti-freeze resulted in the protection not being maintained. Anti-freeze testing difficulty may be broken down between incorrect reading of the tester and inaccurate, damaged and dirty instruments. Testers should be checked periodically for accuracy with a solution of known freezing protection.

Coolant Level Irregularities

Coolant shortage and conditions contributing directly to overflow loss were reported in 14 per cent of the failures. Among causes of overflow loss were overfilling, air suction, thermal surge, pumping over, and foaming of coolant. A close check on coolant level would have uncovered all these conditions.

Miscellaneous & Undetermined

Worthy of mention in 3½ per cent miscellaneous causes of failure, are improper use of radiator covers and breakage of valve springs, the latter associated with internal coolant leakage, and crankcase condensation from "cold" engine operation.

In the final 3½ per cent of failures the cause was reported as undermined.

Practical Approach to PM

We believe the most practical approach to cooling system maintenance is through the medium of cool-

(TURN TO PAGE 110, PLEASE)

FELT PRODUCTS MFG. CO.
NO MERCY FOR THE LITTLE DRIP!
-or BIG ONES!
Show no mercy to "drips" of water or oil —enemies of automotive transportation— hampering its vital service—wasting time and money.
It's one of your war-time jobs to fight these "drips" relentlessly—and lick 'em. Do the job right with scientifically designed, quality Fel-Pro Gaskets, Metallic Pump Packings and the many other Fel-Pro Sealing Materials. Use them on cylinder heads, manifolds, oil pans, pumps, etc. Available packaged in boxes or sets for your convenience.
Altho Military and War Industry needs are taking most of the record capacity of Fel-Pro's greatly enlarged plants, we are doing our level best to supply our Jobbers. So to save time and make sure of the right gasket for each job . see your Fel-Pro Jobber First.
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WHEN SPARK PLUG COSTS RISE, CHECK—

1. HEAT RANGE. Use of the wrong type (incorrect Heat Range) makes replacement necessary too soon. Plugs of inferior quality produce the same result.

Wrong Heat Range and poor quality increase other costs, also. They both *reduce engine power* and gas economy.

2. CLEANING AND REGAPPING. Dirty and worn plugs waste up to one gallon of gas in ten. All plugs should be cleaned—and accurately regapped—every 3,000-5,000 miles.

This double check will not only hold down spark plug and operating costs. It will also keep your equipment rolling, better . . . and conserve gas, oil, and materials for the war effort.

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Gentlemen: Please send at once, no charge, the
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- ☐ HOW TO SERVICE SPARK PLUGS
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Here's What's New in Hydraulic Units

TOWER LIFT with Low Initial Height

Here is the answer to a modern Tower lift—new simplified design, new engineering, new type construction and new low cost.

This new tower is a design achievement which permits improved body styling, has low initial height with extreme elevations. Tower is controlled from the lift platform which is operated by twin telescopic rams. These units can be adopted to meet your requirements—from the streamlined truck to the open back utility truck.

Patented

DUMP HOIST for ½, ¾ and 1 Ton Trucks

Here's a new, lightweight, high pressure hydraulic dump hoist which permits high speed dumping. Low mounting and low loading height, under 48". Two hydraulic rams offer utmost stability and enable operator to raise and lower dump while truck is in motion. No subframe . . . fewer "wear out" parts . . . ideal for hand loading. Designed for the lighter jobs, up to 2000 pounds payload.

Descriptive literature available. When writing please advise in which unit you are interested, Towers or Dump Hoists.

BIRD-WHITE COMPANY

DEPT. 4. 3119 WEST LAKE STREET, CHICAGO, ILLINOIS

CAUSES AND CURES OF COOLING TROUBLES

(CONTINUED FROM PAGE 108)

ant inspection—(1) coolant level, (2) coolant temperature, and (3) coolant condition.

With better understanding, by the driver and mechanic, of the full significance of these three simple inspections, a starting point can be set for systematic preventive maintenace, which, with the least amount of time, work and expense, will anticipate overheating and overcooling difficulty from any cause, and will also avoid the gradual loss of cooling efficiency from rust formation. Many expensive failures are caused by the simplest irregularities that could have been detected by this three-way coolant check.

When inspection of coolant temperature level or condition reveals the first sign of irregularity, then a procedure for systematic trouble-shooting should be followed which will get to the cause with the least amount of disassembly and effort.

We think it can be stated without fear of contradiction that if water were as expensive as lubricating oil, there would be more attention paid to coolant level control, both in design and maintenance. With evaporation a very small factor in coolant loss, the best indication of proper cooling system condition is a coolant level that "stays put." On the other hand, the need for frequent or usually large additions of coolant to maintain proper liquid level is one of the earliest signals of impending trouble.

As a sensitive indicator of cooling system condition, the coolant level may be called the focal point of preventive maintenance. Daily inspection of coolant level ranks is important with inspection of fuel and lubricating oil, and preferably should be made at minimum driving temperature, but with the engine stopped.

Coolant temperature inspection simply calls for habitual observation of the engine temperature gage by the driver during vehicle operation. However, for the driver to be impressed with the importance of the temperature gage reading, it must be dependable and the driver should be provided by the manufacturer with

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(CONTINUED FROM PAGE 110)

the maximum and minimum safe operating temperatures applying to the particular vehicle.

Inspection of coolant condition weekly will be found a dependable guide for rust prevention and cleaning services. Starting with a clean cooling system, the regular practice of corrosion prevention, prompt replacement of rusty coolant, and preventive cleaning, will go a long way toward maintaining all the cooling capacity originally built into the system. A certain amount of experience and judgment is required to determine the proper replacement point of rusty coolant. With some inhibitors, fresh coolant installed in a dirty system will become rusty prematurely, due to loosening of existing rust, although the coolant itself may still be giving adequate corrosion protection. Check of coolant condition during the winter season of course includes testing of anti-freeze weekly, or at any time there is reason to think the system may not be properly protected against freezing.

END

(Please resume your reading on P. 46)

FLEET GETS SIX RECAPS ON DUAL SET

(CONTINUED FROM PAGE 65)

ping jobs. Our price for a recap is $17.50, based on an 8:25 x 20 tire. The economy is obvious compared with the list price of $85 for a new wartime tire in the 8:25 x 20 size."

County Fleet Averages Two

The Hillsdale County Road Commission, with maintenance garage in Hillsdale, Mich., operates 37 trucks, mostly dump trucks, and five large motor graders, on county road construction and repairs.

In discussing their tire maintenance program, C. W. Ellenwood, who has charge of tires and lubrication, said: "We use recaps regularly. Since the war emergency, we are averaging two recap jobs for each carcass. We have tires in use which have been capped the third time. These units use 8:25 x 20 sizes. Our graders use 13:00 x 24, and we have these large tires fully retreaded when they wear smooth. These slow-moving units wear the treads smooth in about two years, as they push tremendous loads and the traction on tires is terrific. Full retreads wear comparably with original treads on these graders.

"Our dump trucks average 150 miles per day for 22 days per month, or 3300 miles per month. We obtained about one year's service from original tread of pre-war tires, and we got an equal average mileage from each recap, pre-war quality camelback. The wartime new tire lasts us about six months, with comparable service on wartime camelback for recaps. We find that synthetic camelback recap stock wears off faster than pre-war rubber, in the proportion stated above.

"We recap our tires a little sooner than we formerly did, as we found that by leaving a little thicker layer of rubber for a cushion to carry the recap, we get a much more satisfactory job, namely, four to six months per wartime recap.

"The work our dump trucks do is gruelling. The round trips average 20 miles, carrying an average of

(TURN TO NEXT PAGE, PLEASE)

GATKE
BRAKE BLOCKS
and LINERS
Custom-Bilt
for the JOB

Made for all Cars, Trucks, Tractors, Trailers, Buses and Heavy Duty Axles.

War-essential transportation makes the Extra Performance Values of GATKE *CUSTOM-BILT* Brake Blocks doubly important now—

The *smooth, non-grabbing action* adds *countless* miles to tire life.

Dependable stopping under all service conditions avoids accidents and delays.

The long wear life means *extra miles between adjustments.*

Whatever your equipment or service, GATKE Brake Blocks and Liners *CUSTOM-BILT* for the Job offer many other advantages.

Ask your GATKE Jobber or write.

GATKE CORPORATION
228 N. La Salle St. Chicago 1, Ill.

FLEET GETS SIX RECAPS ON DUAL SET

(CONTINUED FROM PAGE 115)

three yards of gravel or crushed rock, or around 9000 lb., based on 3000 lb. per yard of gravel. The trucks run right along at the legal speed of 35 miles per hour on the open roads. In spite of this hard service, we recap at least twice for each carcass, and one-half of these are recapped the third time.

"Obviously, our trucks operate on the worst roads, where repair work is being done. These rough roads, often having deep holes with sharp edges of pavement sticking out, are hard on tire carcasses, and in consequence, it is necessary to resort to having sections vulcanized in before recapping. Before the war, we required carcasses with not more than one sectional repair for recapping, but we now have as high as five sections in a tire. We mount these sectionized recaps on rear wheels so that we avoid shimmy or poor steering control, if such unbalanced tires were put on front wheels.

"We carry the exact air pressure schedules which each manufacturer recommends for his brand of tires, even although it be different from that recommended by some other manufacturer. Proper air pressure, we believe, is the primary factor in getting all the inbuilt mileage on tires—carcasses, original treads and recaps. It is my job to check all tires, and remove them for recaps when the treads are smooth. We leave it to our tire man's judgment from his inspections, whether to recap or reject any and all carcasses turned in to him.

"Matching duals is important. We try to put new tires or new recaps side by side, but when this is impossible, as it is sometimes, we put the thinnest tire inside, and remove as quickly as possible, replacing with another of equal tread thickness.

"Besides the appreciable amount of rubber which this program saves there is a worth-while money saving to the county. For example, unless there are vulcanizing sections, there is a wide spread between the cost of a new tire, and the recap, namely, on 8:25 x 20's, the new tire list is $85, compared with $17.50 for the full recap. Even with several sections, there still remains a wide margin of savings. On the larger sizes, the proportion is even more. To illustrate, the 13:00 x 24 grader tire lists at $239.25. The price of a full retread is $53.30. The savings are increased further by the second recap on the original carcass."

Mr. Ellenwood explained that one or more sections vulcanized in their dump truck tires, when recapped, do not cause road failures, due to the fact that their hauls are short. The average distance of routes does not exceed 20 miles round trip. Therefore, they are not subjected to the weakening effects caused by internal heat, created more intensively on long hauls without stops for cooling-off periods.

Over-the-Road Fleet's Experience

The Reliable Oil Co., of Fort Wayne, Ind. operates 18 tractors on contract hauling—also one straight oil truck which uses four tires on each side of rear tandem axle. Tire

(TURN TO PAGE 120, PLEASE)

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for
AUTOMOTIVE INSTALLATIONS, FARM TRACTORS, HOUSEHOLD and COMMERCIAL REFRIGERATION, AIR CONDITIONING, OIL BURNERS, BOTTLED GAS, MACHINE TOOLS, INDUSTRIAL EQUIPMENT, ETC.
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Both ends sealed to protect from dust, dirt, moisture, oxidation
Supreme quality tubing that successfully meets the most exacting requirements. Reaches you without flat spots, dents, kinks or variations in roundness and temper. Free from "burns," seams, laps, slivers or other defects.
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a small fortune to you!

It costs you money not to know what DETERGENT . . . DISPERSIVE . . . CORROSIVE-RESISTANT mean!

And there's an extra bonus for you in this—

Veedol 90 Heavy Duty permits easier starting and faster distribution of the lubricant through the engine under cold starting conditions. *Lowers oil consumption* under ALL conditions, particularly when operating at high speed and hot oil temperatures.

What's more, Veedol 90 Heavy Duty has all the natural advantages of being made from 100% Pennsylvania crude — world's best wear-resistant!

The Veedol 90 Heavy Duty Series is available in various S. A. E. numbers branded as 91, 92, 93, 94 and 95. Tell us what you need *today*.

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The Famous Veedol P. M. Plan is waiting for you, too!

The Veedol Preventive Maintenance Plan is doing a whale of a job for over 800 hard-working fleets. It can help yours. The plan can be tailored to fit any number of units — and costs only 18¢ per truck. Write today for a Tide Water representative to call and go over this *proven* lifeguard for rolling equipment.

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GASOLINE POWERS THE ATTACK—DON'T WASTE A DROP! • BUY MORE WAR BONDS

FLEET GETS SIX RECAPS ON DUAL SET

(CONTINUED FROM PAGE 116)

sizes used are 8:25 x 20, fronts; 9:00 x 20 on tractor duals. These tractor trucks cover from 1200 to 1800 miles per week hauling trailers carrying heavy loads of war materials in the Mid-West industrial area.

Ervin C. Meyers, maintenance foreman, reports that pre-war tires turned in 60,000 miles and up to 100,000 miles on original treads, and that pre-war recaps averaged an easy part with original new treads. He went on to say that wartime tires are falling far below pre-war quality, with 30,000 miles a fair average on original treads. The tendency of the rubber is to check and crack open between the ribs or skid designs.

To obtain the maximum mileage out of recaps, front tires are recapped (if the casings are sound) and put back on front wheels. When rear duals wear smooth, if sound, they are recapped, too, but are mounted on front wheels in pairs. This company does not mount recapped tires on driving duals, claiming from past experience that the extra burden of carrying the load, and the traction, wears tires prematurely in any case, but the worst factor is carcass failure with recaps. Duals and fronts are matched whenever possible, by mounting tires or recaps of same tread thickness for most mileage and safety factors.

The company follows tire manufacturers' air pressure recommendations to the letter, and this includes carrying 5 lb. more pressure on inside duals than in their outside mates. This company finds that recapping saves money with few or no road failures, barring unavoidable accidents to treads or carcasses. The plan is, simply, to watch the tires closely and change before failures happen.

80,000 Miles From Recaps

In a recent interview with Everett Metcalf, fleet superintendent of the Kuhner Packing Co., Fort Wayne, Ind., he said: "We have been recapping our tires for many years for reasons of economy of fleet operation. We always obtained good mileage from our new tires and recaps by working closely with competent tire dealers, cooperating with them as to loads, inspections, inflation, repairing injuries promptly and following their advice as to when the worn carcasses should be recapped.

"For example, tread wear on our pre-war tires averaged between 70,000 and 80,000 miles on original rubber. Recaps gave us equal or even better mileage than new tire treads, using pre-war camelback. Fortunately, our mileage with wartime recaps, using wartime camelback, continue to be good. Our present-day recaps on synthetic camelback are holding up—wearing good, in fact. These recaps are now running from a 50,000-mile minimum to an 80,000-mile maximum. And we are checking our tires so closely every day that actual road failures rarely ever happen.

"The big thing is, we can now save 75 per cent of our tread-worn casings for one recap job; 50 per cent of these carcasses get a second

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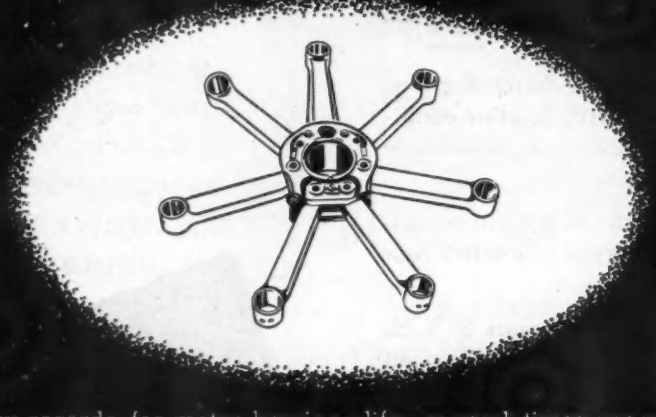
BETTER BEARINGS *with* INDIUM



New records for motor bearings life—several times pre-war's best—are being turned up despite the tight situation in white metals. In INDIUM, manufacturers found the answer.

By plating INDIUM onto the contact surface of the bearing and then diffusing it, metallurgists are able to impart a high concentration of INDIUM just where needed. The hardened surface of the bearing proved far more resistant to wear, oil-corrosion, and softening, without loss of its anti-friction value.

Several builders of aircraft engines, Diesels, and motor trucks are putting this life-giving element in bearing metals for their power units. Why not see what it can do for you?

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FLEET GETS SIX RECAPS ON DUAL SET

(CONTINUED FROM PAGE 120)

recap; from these 20 per cent can be recapped a third time; about 10 per cent of the remaining ones can be recapped the fourth time.

"We have one pair of tires which were recapped six times. They delivered 350,000 miles, or an average of 50,000 miles for each tread—the original, and the six consecutive recaps. Obviously, our greatest savings come from the multiple recaps; therefore, diligent care of the tires pays the best dividends.

"These records may seem strange in the face of lower grade camelback, but we attribute the continuing good results and actual improvement in tire mileage from recaps to our redoubled care of tires, a strict compliance with the 35 miles per hour speed regulations, not overloading our trucks, and testing all tires daily for proper inflation. We observe tire makers' inflation rules to the letter. Besides, drivers are requested to look for possible under-inflation on their runs to catch any tire that might have developed a slow leak, and if so, to change it at once. Tread injuries are repaired promptly to prevent water from seeping into the carcasses to separate plys or weaken them.

"We remove all carcasses for recaps when the center tread surface wears smooth—while there still is 2000 or perhaps 3000 miles obtainable from the rubber. This may look like a waste of rubber and money. The opposite is true. We have found this to be one of the big reasons why we get so much more mileage from our recaps, why we can recap up to three, four, five and even six times per tire carcass, and why road failures (blow-outs) are almost nil. The three tires shown in the accompanying picture are good examples of this part of our tire program.

"We do have some trouble with ply separations in the wartime tires. However, such failures are rarely ever premature. Loose shoulders also occur more often than with prewar tires. For example, today we removed an 8:25 x 20 truck tractor tire which developed loose tread for nearly its entire circumference. It started from a loose shoulder. It happened with the second recap when the latter was about two-thirds worn off. However, the tire's total record was 165,000 miles—about 60,000 on the original tread, 60,000 on the first recap and about 40,000 on the second one.

"Another factor which we think is important, is the selection of competent tire men to do our recapping and repairs. We divide this work between three reliable operators. We select them for the quality of equipment they use, their reputation for honesty and ability to do good work over a long period of time. Accurate tire inspections before recapping are necessary to remove guesswork and insure safe, economical mileage.

"Hidden faults, for example, are responsible for most premature carcass failures, then the cost of the recap job is lost, the labor of changing tires and so forth. Our suppliers have proper equipment to detect these faults if any exist. They have proved their honesty by throwing out

(TURN TO NEXT PAGE, PLEASE)

"GRAF-FLOX" TREATED PISTON RING
Microphoto* reveals Burd electric furnace iron has uniformly distributed natural graphite for inherent lubrication .... abrasive surface particles removed ... self-lubrication assured by application of colloidal graphite
OLD TYPE PISTON RING

SEE WHY "Graf-Flox" ELIMINATES "RUN-IN"

This laboratory photo* shows uneven grain structure and poorly distributed natural graphite in ordinary cupola-iron ring. Note metal particles on ring surface, left by machining, which cause trouble in cylinders.

★ Now you can *SEE* why Burd "Graf-Flox" Piston Rings are faster seating ... why a Burd equipped car or truck needs no run-in ... can be driven right from the shop under full load and speed ★ In the first place, in Burd electric furnace iron the distribution of natural graphite is scientifically controlled. This gives "Graf-Flox" rings inherent self-lubrication ★ Secondly, an exclusive process completely removes abrasive metal particles that remain on ring surfaces after grinding ★ Third, to insure self-lubrication, a deeply penetrating layer of colloidal graphite is applied by a special Burd method ★ These are the reasons why Burd "Graf-Flox" Piston Rings seat faster without scoring, seizing, scuffing or sticking in grooves ... why "Graf-Flox" adds thousands of miles to piston rings and engines.

*Photomicrograph by Independent Research Laboratory.

"Graf-Flox" BRINGS THESE ADVANTAGES TO BURD RINGS

★ QUICKER SEATING ... ... NO RUN-IN NEEDED
★ NON-ABRASIVE ... ... NO DANGER OF SCUFFING
★ SELF-LUBRICATION ... ... NO SCORING, SEIZING
★ PREVENTS RINGS STICKING IN GROOVES.
★ ADDS LIFE TO RINGS and MOTORS

BURD PISTON RING CO., ROCKFORD, ILL.

BURD "Graf-Flox" PISTON RINGS

FLEET GETS SIX RECAPS ON DUAL SET

(CONTINUED FROM PAGE 123)

all carcasses which show ply separations or other weaknesses, visible or hidden. The war emergency has brought out numerous tire shops with dubious equipment and the owners either lack skill to do good work, or cannot hire competent men to do it.

"We see examples of shoddy work almost daily and we have to be guided by our experience, namely, to pay a competent tire man a fair price for his quality work. This way, the vast difference between the price of a good recap and a new tire, is a money saving factor that is very much worth while.

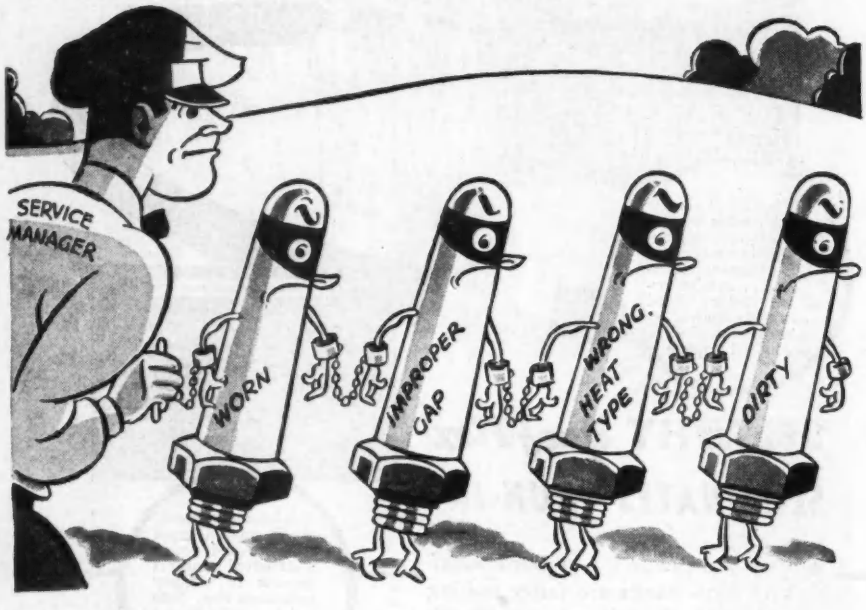
"Our trucks and trailers have gruelling work to perform—our units average 300 miles per day—although some cover up to 400 miles daily—delivering our meat products to army camps in our area from 150 to 250 miles distant from our Fort Wayne plant. They carry heavy loads, but are never overloaded. We want to emprasize that point in our endeavors to get economical recap mileage. We use 7:50 x 20, 8:25 x 20, 9:00 x 20 and 10:00 x 20 tires on our trucks according to size of units and loads carried, based on tire makers' recommendations.

END

(Please resume your reading on P. 66)

Ralph Reel, left, newly appointed vice president in charge of manufacturing, and Hynes Pitner, vice president, are shown inspecting the new Pharis S-3 synthetic rubber tire, which has a three-way guarantee behind it. The guarantee is in writing and includes (1) a 90-day free replacement of the tire, or its complete repair, if it fails for any reason at all; (2) a 24 months' guarantee on a pro rata basis, to apply to Pharis S-3 tires on all cars except those in commercial service, which are guaranteed six months on a pro rata basis; and (3) the Manufacturers' Standard Warranty applying for the life of the tire, as regards defects in workmanship and material.

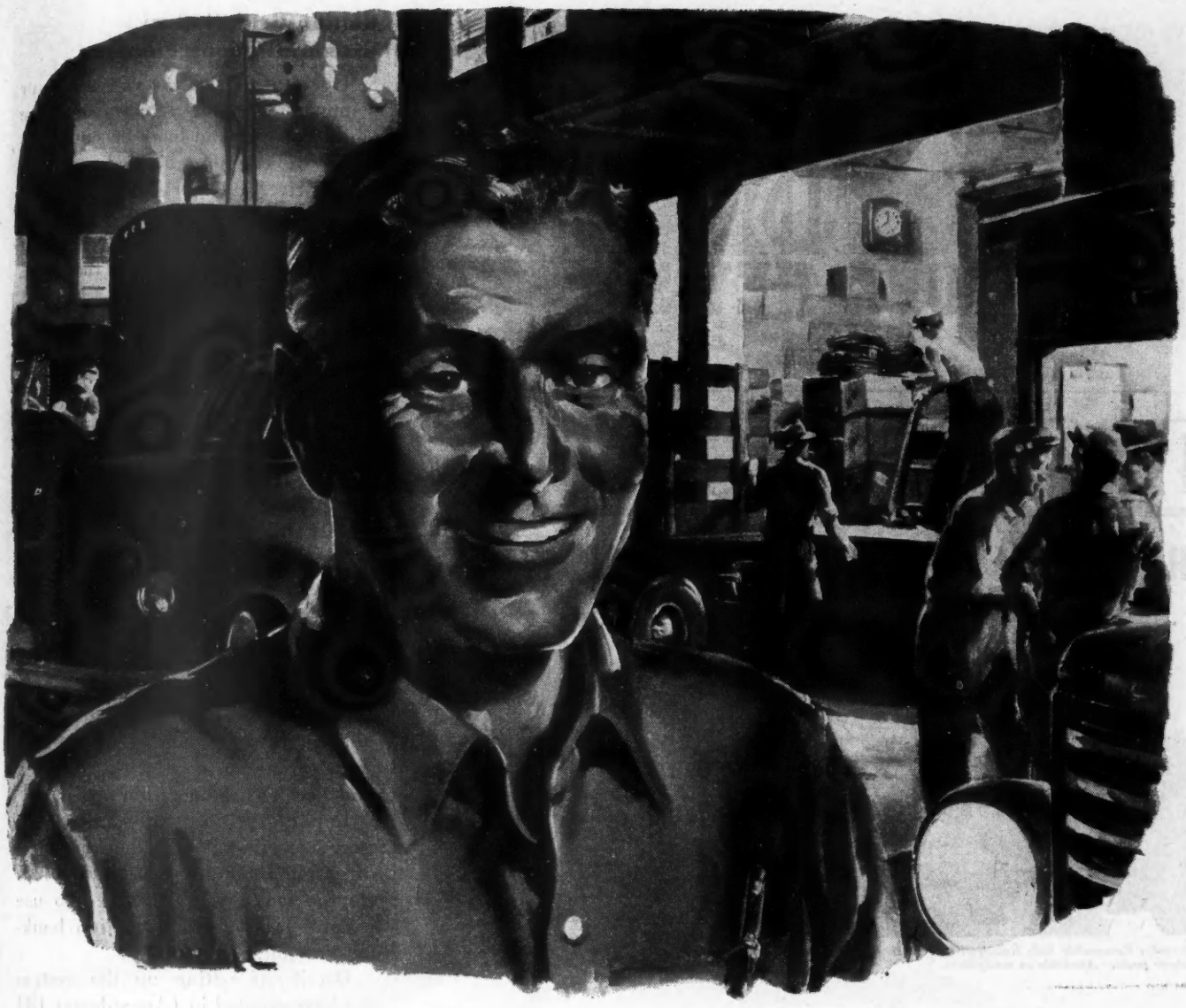
Here is a picture that truly tells a story of a thousand words. Pfc. Harry Forney, Waynesboro, Pa., is explaining the air compressor to Chen, a Chinese mechanic at SOS's 2nd Echelon Shop. How the air compressor got to China is part of the story, too. After leaving the Kellogg Division of American Brake Shoe and Foundry Co. shop in Rochester, it traveled by train to a port of embarkation in the states, then via Liberty Ship for 74 days to India. From the supply dock in India, it went by motor convoy to the foothills of the Himalayas to be re-loaded on a famous ATC Douglas C-47 cargo carrier. This plane carried it across the "hump" to a base in China, where it is now an essential piece of equipment used to keep rolling the vehicles that supply Chinese and American fighters on the far eastern fronts.



You'd better handcuff these "POWER THIEVES!"

Faulty spark plugs can rob you of one out of every ten gallons of gas you put into a tank! That's certainly good reason for insisting upon regular check-ups of all spark plugs in service. Be sure they are clean, properly gapped, correct heat type. When new plugs are needed, install Edisons—they get full power from every ounce of fuel. The "greatest name in electricity" guarantees their performance!

Edison
SPARK PLUGS
EDISON-SPLITDORF CORPORATION, WEST ORANGE, N. J.



"I'm trucking my next load for a kid in a foxhole"

"WE just got a letter from my son, Jim, today. He's manning a machine gun 'way off somewhere in the jungles. Jim never squawks when he writes, but he does admit it gets pretty tough at times in those foxholes. So I thought I'd make my trip tonight a kind of salute to Jim."

★ ★ ★

Yes, America's truck drivers, like most of the rest of us on the home front, are fighting this war with their hearts as well as with their brains and brawn.

Yet the public, for the most part, knows very little of the tremendous job that the trucking industry has been doing, without fuss or fanfare, in providing vital wartime transportation.

Scarcely any new equipment is available. New tires and repair parts are often difficult to obtain. Experienced co-workers are constantly entering the armed services. But, despite these handicaps, the truckmen of the nation have accomplished near miracles in keeping their hard-worked, critically needed trucks rolling.

You may be sure they appreciate every co-operation the rest of us can give them—such help as reducing the number of motor truck deliveries we request—having shipments properly packaged or crated and ready on time—keeping the approaches to loading platforms clear—expediting repairs for trucks in trouble.

STUDEBAKER

PIONEER AND PACEMAKER IN AUTOMOTIVE PROGRESS

Now building Wright Cyclone engines for the Boeing Flying Fortress—multiple-drive military trucks—other vital war matériel

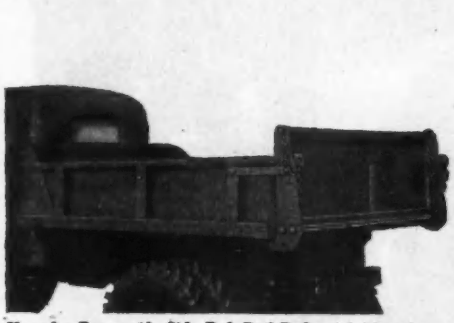
OFFICE OF PRICE ADMINISTRATION

OPA NEWS

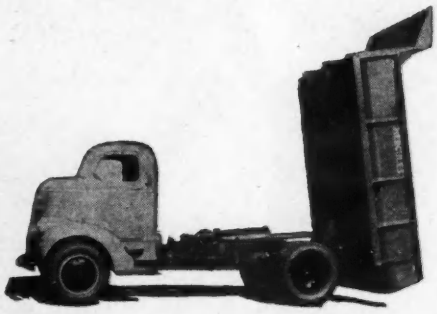
HERCULES

HYDRAULIC HOISTS and DUMP BODIES

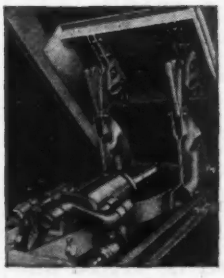
GIVE DEPENDABLE SERVICE ON ALL KINDS OF JOBS



Hercules Removable Side Rub Rail Body with hinged rear corner posts. Available in many sizes.



Hercules High Dumper—Power up, power down with 78° dumping angle. Equipped with 12 ton capacity hoist.



HERCULES HYDRAULIC BOOSTER HOIST

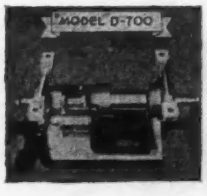
Makes any truck a Dump Truck

Install HERCULES DOUBLE-ARM HYDRAULIC HOISTS under your platform, stake, express or special bodies, which are now idle. Unload the easy way!

This is the Model KXE Hoist, with 6" cylinder, for bodies up to 12 feet long. Body reinforcing plate and steel sills included. Control valve is operated from driver's seat.

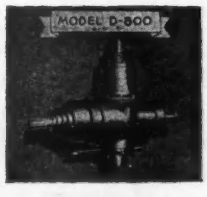
USE THE HERCULES SPLIT-SHAFT POWER TAKE-OFF

To operate any truck-mounted equipment



Direct (D-700 Series), Side (D-800 Series) and Dual Drive (B) models are available for operation of almost every possible type of truck-mounted equipment, either singly or in combination.

Recommendations and complete specifications upon request.



HERCULES STEEL PRODUCTS CO.

GALION, OHIO

Ration Bank System Extended Among Fleets

Operators of fleets of official or commercial motor vehicles may use checks on a ration bank acccount, instead of coupons handed over by their drivers at the time of transfer, to settle for gasoline delivered into the tanks of units of their fleets under a procedure announced by the OPA.

The plan, effective July 14, 1944, is designed to stop the flow of coupons from drivers of fleet vehicles into the black market, by taking the coupons out of the hands of drivers and allowing the operators to make deferred payments by ration check. The "float" of these rations has been an important source of supply of the market for illegal gasoline coupons.

Only fleet operators who use 960 gallons of gasoline or more a month, and who buy this gasoline on monetary credit under PAW Directions 62, are eligible to apply the plan. And only gasoline dealers or distributors who have been designated individually by operators to whom they sell gasoline on monetary credit may make such sales on ration credit.

Heretofore, only bulk users who were receiving 960 gallons or more of gasoline monthly for delivery into storage tanks were permitted to use ration checks against a ration banking account.

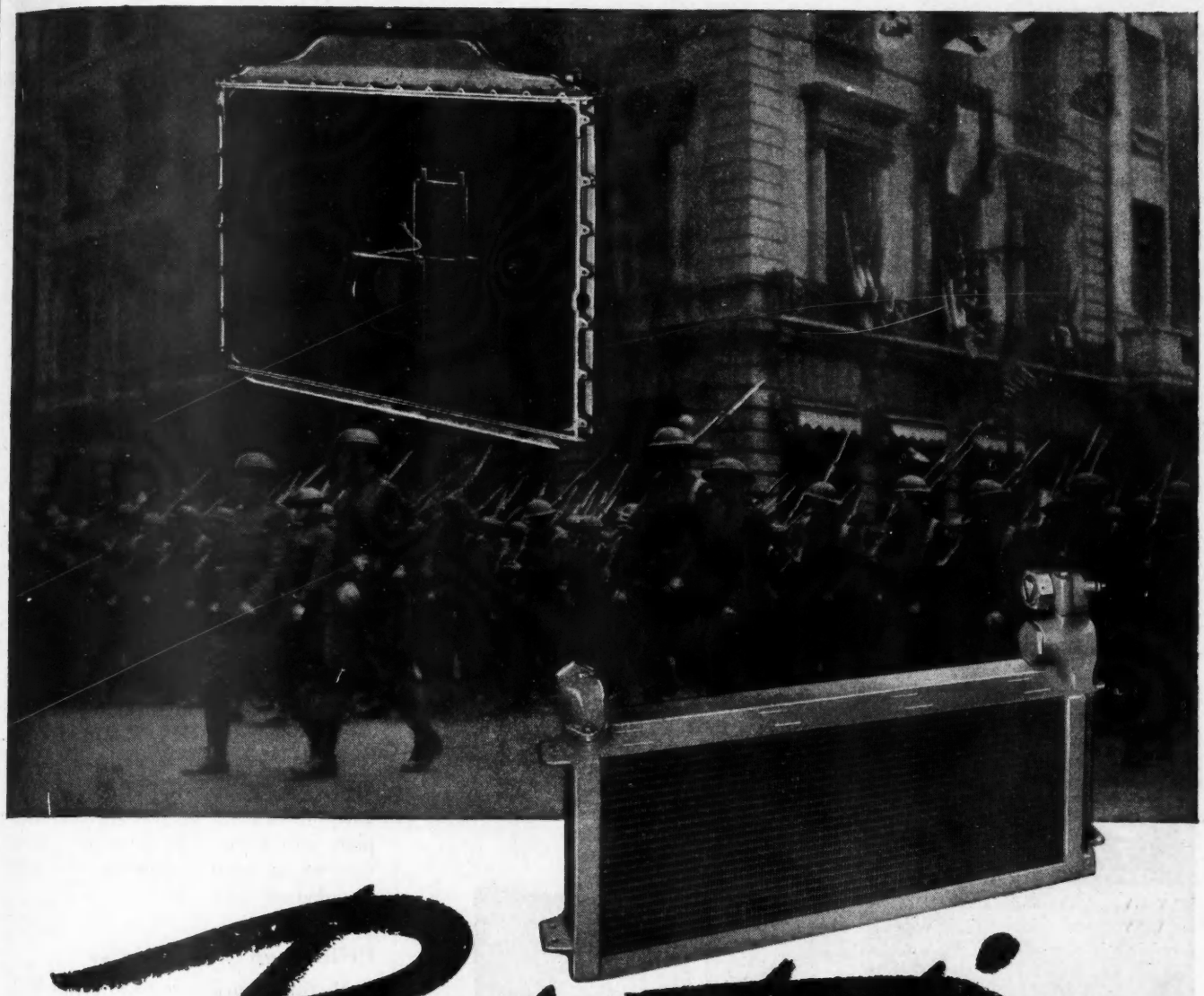
Details of setting up the system are incorporated in (Amendment 134 to Ration Order 5C-Mileage Rationing Gasoline Regulations—effective July 14, 1944.)

New Tubes Unrationed

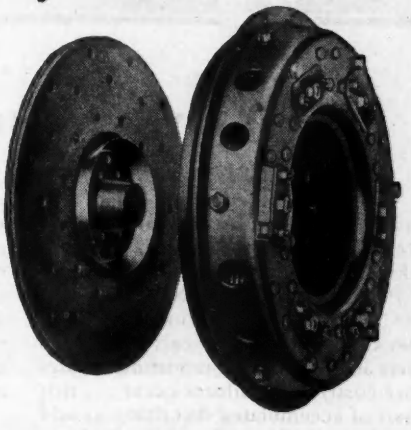
All new tubes — passenger car, truck, tractor, implement—were removed from rationing on July 1, by the OPA. Demand has been running at the rate of approximately 1,500,000 tubes per month. Present inventories and production are adequate to meet this demand, OPA said.

Rations Made Public

A uniform policy to make available to public inquiry the amounts of gasoline rations issued by local War Price and Rationing Boards has been laid down by the OPA. The policy applies to all types of gasoline rations issued after June 30, 1944. Information will be given only as to the amount and type of ration issued to individuals.



Reputation



Long's reputation for quality, dependability, and performance went to war 25 years ago and again with Japan's attack on Pearl Harbor. Today, Long radiators, clutches, and oil coolers are serving on all war fronts, hastening Allied victory . . . helping bring the day when they can return to peacetime vehicles.

LONG MANUFACTURING DIVISION
BORG-WARNER CORPORATION

ARMY E NAVY

DETROIT 12, MICHIGAN
WINDSOR, ONTARIO

LONG
CLUTCHES • RADIATORS • OIL COOLERS

OPA NEWS

(CONTINUED FROM PAGE 126)

Truck Tire Quota Cut Expected in August

In announcing July tire quotas, Rubber Director Bradley Dewey said, "Present indications are that the August truck tire quotas will be substantially reduced." Difficulties confronting manufacturers plus military demands are said to be responsible.

Truck tire quotas for July were: 375,000 tires 7.50 and under; 135,000 tires 8.25 and up.

Fleets May Sell Used Cars at Warranty Price

The OPA has ruled that in the application of the provisions of MPR 540, Maximum Prices for Used Passenger Automobiles, owners of fleets of passenger cars who maintain adequate repair and maintenance facilities or who have a working arrangement with a firm having facilities for repairing and reconditioning, may recondition and sell used cars at the "warranty" price, the same as dealers, provided they receive permission from and have their qualifications approved by local or regional OPA offices.

This interpretation of the term "dealer," as defined in the regulation, is the same as that prevailing under MPR 341, Used Commercial Vehicle Price Regulation.

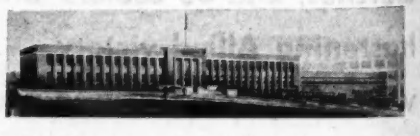
No Used Car Rationing

Price Administrator Chester Bowles is on record as saying that used car rationing is not in immediate prospect.

"The Office of Price Administration has not received a directive from the War Production Board to ration used cars and has not received any indication that it will be asked to do so," Mr. Bowles said. "Even assuming that such an an order were received today by OPA, it would take at least three months to print and distribute the necessary regulations and forms, and to put a rationing plan into effect. It is evident that rumors of early rationing are not founded on fact."

Ceilings on Army Trucks

Maximum prices for 450 types and models of used Army vehicles may now be established by the same method as that already provided by the regulation governing sales of used commercial motor vehicles, according to the OPA. Included in the list of Army vehicles now covered by the used commercial motor vehicle regulation are specially built trucks, trailers, reconnaissance vehicles such as "jeeps," station wagons, and many other types of vehicles.



This three-story, reinforced concrete building, now under construction, will house the factory and general offices, employment office, hospital, research laboratories and tire testing facilities of the Seiberling Rubber Co., Barberton, Ohio. It will release for production and storage all space now being occupied by the Seiberling offices, at present housed in a converted factory building in the heart of the plant allotment. The new building is scheduled for completion late this year.

BY CLEANING YOUR TRUCKS
THE JENNY "STEAM SPRAY" WAY

Hundreds of fleet owners are getting more miles and longer service from their trucks by keeping them clean with HYPRESSURE JENNY STEAM CLEANER, because periodic JENNY Steam Cleaning often reveals cracks and defects in equipment permitting repairs before costly road failures occur . . . rids chassis of accumulated dirt that may add as much as 400 pounds extra weight to the load . . . reduces fire hazards. Besides, HYPRESSURE JENNY Steam Cleaning before repairs, conserves precious man-hours by saving up to 40% of mechanics' time usually wasted wiping dirt and grease from tools and equipment. JENNY is handy in the shop and garage, too, for cleaning floors, pits, runways, walls, windows, etc., quicker and better than by any other known method.

You too, can keep your trucks hauling and make 'em last longer by keeping them clean the JENNY Steam-Spray Way. Write for complete details, without obligation, of course.

HYPRESSURE JENNY DIVISION OF
HOMESTEAD VALVE MFG. CO.
P. O. BOX 90 • • • CORAOPOLIS • • • PENNSYLVANIA
MAKERS OF PEAK PERFORMANCE VALVES FOR 50 Years 1892 1942

Heavy Duty Fuel Lines

. . . FOR HEAVY DUTY TRUCKS

YOU can't compare any other oil or gas line with Titeflex—because no other line is made like Titeflex.

Unlike ordinary flexible lines, Titeflex is all metal. No packing. No composition materials. Nothing that can be affected by high engine temperatures or by the damaging effects of oil, gasoline or moisture.

Then, for further protection, Titeflex construction provides not one but 4 thicknesses of metal at point of greatest wear . . . provides a metal braiding woven onto the line itself for greater strength and greater durability . . . provides a flexibility that withstands constant, grueling vibration.

Add these features together and you'll realize why Titeflex has been a "natural" for the trouble free operation of tanks, jeeps, trucks and other vehicles of war. Make Titeflex a part of your service—for trucks, buses and commercial vehicles. And incidentally, make the profits that the Titeflex line affords.

TITEFLEX, INC.
525 Frelinghuysen Avenue,
Newark 5, New Jersey.

QUIZ ANSWERS

CCJ Quiz on Page 76

1. a. The automatic fifth wheel. Actually, most of the developments in trailer construction did not occur until the middle thirties.

2. d. The latest figures we have show Keeshin operating a fleet of 911 trailers with 460 tractors. Kroger is second with 800 trailers and 500 tractors.

3. b. Pacific Coast. Regulations on length and weight in the western states have worked to the favor of the full trailer. More than one-third of all full trailers are registered in the three Pacific Coast states.

4. a. Headquarters of Supreme Commander Dwight Eisenhower on Invasion Day, June 6, was a trailer in England.

5. c. A tractor-trailer combination weighing 12,295 lb. will carry a net payload of 30,500 lb. in level country, or a payload ratio of 1 to 2.4. With every pound of steel needed to serve some wartime job, the figures speak for themselves. Freight car figures are based on 48.5 cars per train.

6. c. Trailer operation is 70 per cent faster than rail freight. According to reports made by the Association of American Railroads, the average speed of freight trains between terminals is 16.7 m.p.h. Interstate Commerce Commission studies show the average speed for truck-trailer combinations to be 27.5 m.p.h. between terminals. And add one more fact—the trailer averages longer hours operated per day.

7. c. As a deterrent to "jack-knifing" the braking effort on the rearmost trailer wheels should be applied first or at the fastest rate. I.C.C. safety regulations require a system that will provide such braking.

8. c. Although the rounded end does look better and does cut down wind resistance to a certain extent, its chief purpose is to permit the trailer to be coupled closer to the cab, with the resultant reduction in the overall length. The rounded front permits an additional 12 inches of space inside the trailer, while still retaining the same turning ability. This is important in view of the length limitations in many states.

9. a. The history of trailer design has been a long series of savings in weight. Each reduction in weight has brought a threefold advantage—faster operation with the same power and payload, greater payload with the same power at the same speed of operation, or the same payload and speed with less power. There's a tremendous difference between the early trailers of heavy structural iron and today's chassis-less trailers of stainless steel, aluminum and magnesium. Just between 1935 and 1940, the weights of corresponding models of trailers were often reduced more thane one-third.

10. a. True. It was not until 1931 that trailer axles were made of the tubular or the I-beam type.

b. True.

c. True. Trailers have hauled 120-ft., 150-ton barges for the Navy.

d. True. The tanks are then able to enter battle with a full load of gasoline.

END

(Please resume your reading on P. 78)

MEMO
TO: Fleet Operators
SUBJECT: Preventative Maintenance
Install HANDY GOVERNORS on All Vehicles
SAVE 32% on engine repair
SAVE 26% on lubricant costs
SAVE 23% on tire maintenance
SAVE 15% on fuel
SAVE 37% on accident costs
SAVE 30% on brake maintenance
ARMY E NAVY
KING-SEELEY CORPORATION
ANN ARBOR MICHIGAN
MANUFACTURERS OF THE FAMOUS HANDY, HANDY VARI-SPEED AND HANDY VISIBLE ACTION GOVERNORS

NEW

use this Visualizer

for better truck

lettering & signs

SEND FOR TRUCK DECAL VISUALIZER... *Free!*

Visualizer contains outline diagrams of body types, cabs, rear doors, tops, visors, side panels, etc., for sketching and arranging trademarks, lettering, etc. Also includes important data describing the most effective use of the free advertising space on your trucks. Address requests to Department 32-8.

Improve Wartime Truck Appearance with
MEYERCORD DECALS

Pre-war trucks, poorly groomed, look twice as old! It's easy to improve appearance and add to the merchandising mileage value of your equipment with durable, weather-tested Meyercord Truck Decals. They're used on America's leading fleets. Trademarks, product reproductions, lettering and pictorials can be reproduced in any colors or size. Fast "overnight" application saves time and handpainting cost . . . regardless of the size of your fleet. Free technical and designing service. Write for complete details.

Buy More War Bonds... and then KEEP THEM!

THE MEYERCORD CO.

World's Leading Decalcomania Manufacturer

5323 WEST LAKE STREET • CHICAGO 44, ILLINOIS

CONTROLLING HOT ENGINE SLUDGE

(CONTINUED FROM PAGE 41)

Fig. 4 shows the bad sludge deposit on the push-rod cover of an engine operated on straight mineral oil. This sludge was accumulated in two drain periods, the first drain period was 9261 miles, the second drain period was 10,823 miles.

These bad sludge deposits and the badly plugged oil-control ring on the piston indicate that drain periods of this length are too long for straight mineral oil of this quality under these operating conditions.

It will be noted that the 6000 to 10,000 mileage between drains on the straight mineral oil, Figs. 2 to 4, inclusive, are too high and the engines are very dirty.

The engines in Figs. 5 to 8, inclusive, were operated on a commercial "heavy duty" oil containing both oxidation inhibitor and detergent. With the "heavy duty" oil, Figs. 5 and 6, the 10,698 miles without drain is also too much, although the engine was in much better condition than with straight mineral oil for a similar drain period. In Figs. 7 and 8 the same "heavy duty" oil was used only 5103 miles without drain and it is still in excellent condition.

Of course, no one would recommend that oils should be used in actual service for such long periods under such severe operating conditions without draining, but these tests do show the very high factor of safety which the petroleum industry has built into these oils, and how it is possible to avoid Hot Engine Sludge by the use of "heavy duty" oils.

As previously pointed out, the drain period that should be recommended depends upon a number of factors. Perhaps a safe commercial recommendation would be half the anticipated mileage at which the engine would still be clean under the operating conditions to which the engine will be subjected.

4. *High Quality Oils ("Heavy Duty" Oil)*. Regardless of what is done by any or all of the three methods of controlling high temperature sludge that have just been discussed, the car owner or operator who is trying to control Hot Engine Sludge should use high quality oil. This means "heavy duty" oil (one containing agents that are both oxidation-inhibitors and detergents) in commercial engines, and in the post-war period I believe it will also mean use "heavy duty" oil in passenger cars. Until such oils again become available for passenger cars, it means use oil which is as resistant to oxidation as possible under present war restrictions. As previously pointed out, "heavy duty" oils are resistant to the development of acid or sludge, or both, and on draining they should leave a commercially clean engine unless the drain periods are too long to be compatible with the quality of the oil, and the operating conditions.

END

(Please resume your reading on P. 40)

Leasing Charges Exempt

Charges for leasing of trucks between over-the-road truck operators in fulfillment of ODT directives have been exempted for an indefinite period from control by the OPA.

BUY WAR BONDS

for the future safety of our freedom

Buy Ferodo for Road Safety

FERODO
BRAKE LININGS

FERODO AND ASBESTOS, INCORPORATED, NEW BRUNSWICK, N. J.

KILLING FIRE WITH A SNOW STORM

ONE-HAND ACTION!

Easy! So obvious and easy . . . *any* employee can use it. No valves or hoses to twist—no horns to raise!

Fast! Touch the trigger . . . and powerful carbon dioxide charges into the flames . . . smothers the fire in an icy blanket!

Safe! Does not damage equipment or conduct electricity.

Neat! Randolph carbon dioxide is dry and odorless. Actually disappears *after* the fire is out. Leaves no foam or liquids to clean up.

Efficient! Carbon dioxide will not deteriorate. Remains effective in extreme temperatures.

Randolph "4"

CARBON DIOXIDE FIRE EXTINGUISHER

A startled worker snatches the *nearest* extinguisher. No time *now* to think . . . hit the blaze *before* it does damage!

Randolph "4" *simplifies*—speeds fire-fighting. Kills flammable liquid, electric, machine fires with instant, easy action.

Approved and labeled by Underwriters' Laboratories, Inc.

***Mobilize* against fire with Randolph carbon dioxide. For prompt delivery and installation guidance, telephone your nearest supply house or write us — today.**

RANDOLPH "2" Ready to combat sudden "flash" fires. This compact, small unit, with *exclusive* Randolph design, is especially adapted for bracketing in BUSES, TRUCKS, MARINE CRAFT.

Clean, *ideal* protection for HOTELS, HOSPITALS, INDUSTRIAL KITCHENS—*all* INSTITUTIONS.

RANDOLPH LABORATORIES *INC.*

8 EAST KINZIE ST., CHICAGO 11, ILLINOIS

SEND NOW *for new, free booklet "Sharpshooting at Flames." Illustrates latest techniques in carbon dioxide fire-fighting.*

NAME_____

ADDRESS_____

CONTROLLING COLD ENGINE SLUDGE

(CONTINUED FROM PAGE 41)

have an effect upon maintenance costs and service interruptions that are due to engine failures.

(b) It is highly important that draining of the engine crankcase should occur when the oil is thoroughly warmed, has been in circulation a reasonable time and as soon as possible after the engine comes to rest. The sludge in the oil will be more effectively drained from the engine by observing that practice. The cold draining of crankcase oils is very bad practice because it drains off only the oil and leaves the settled oil sludge in the bottom of the oil pan. Discussions with operators reveal they are generally acquainted with the fact that hot oil drains should be practiced. As a rule they are of the opinion they are following that practice. Numerous investigations over many years have failed to find where hot crankcase drains are really practiced, despite claims to the contrary. The same amount of time is required for the draining operation; hence the handling of that problem becomes a matter of supervision in the timing of the work.

(c) Hot oil flushing of the crankcase can be beneficial provided it is handled properly. It will help supplement the "hot drain" in removing any of the sludge material remaining in the bottom of the oil pan and, thereby, prevent its being carried in the case to contaminate the next charge of oil.

(d) Design improvements to facilitate easy cleaning of the oil passage-ways would be a valuable contribution by the equipment manufacturer. That improvement would result in a more thorough cleaning of the oil passageways at the time of engine overhauls. Being easier to handle would promote the desired cleaning. Dirty oil passageways certainly result in the early contamination of the oil and accelerate sludge formation. All we would have to do to get a good illustration of the problem involved in this statement is to make a study of how you would clean some of the oil passageways of some of our engines.

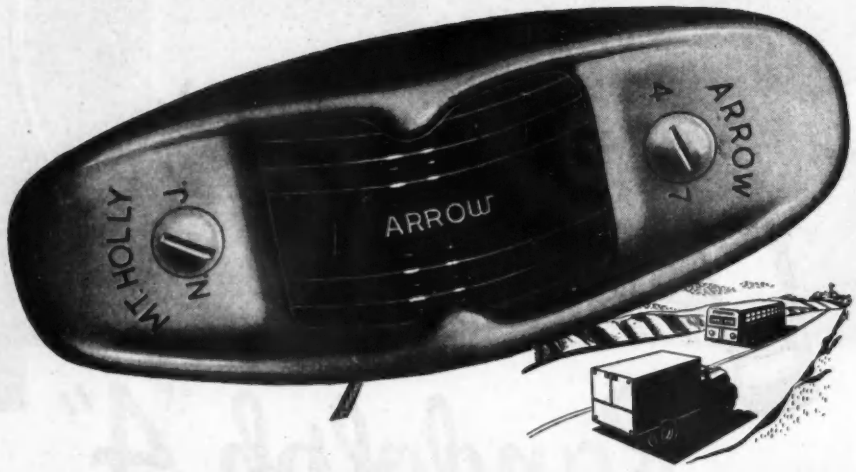
(e) The equipment builders can again render valuable assistance by supplying crankcases that are built to completely drain. Sludge particles settle below the drain point of the oil pan soon after the engine is stopped, with the result that the fresh charge of oil is contaminated with the carried-over sludge material remaining below the crankcase drain from the oil previously in use.

3. Oil Quality. Sludging problems, with their accompanying maintenance costs, are inversely affected by oil quality. Sludges will form more quickly and in greater amounts in the less stable or lower quality oils. As a precautionary measure, it would be advisable and ultimately economical to practice more frequent crankcase drains where less resistant or lower quality oils are supplied.

Products of oil oxidation are sludge promoters. Examination associated with some sludging difficulties, such as in the second tabulation previously mentioned, results in the conclusion that the asphaltenes have been quite active in the forming of a

(TURN TO PAGE 136, PLEASE)

TOUGHER



. . . THAN TODAY'S TOUGH REQUIREMENTS

New Arrow Clearance Lamp Ends Replacement Worries

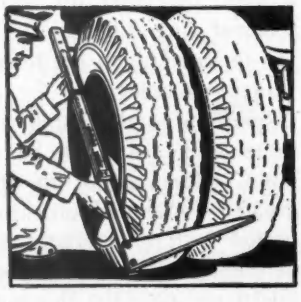
Here's the perfect answer to that clearance-lamp problem. Snuggled down inside a sturdy housing, the lens and bulb are out of reach of back-up blows, side-swipes, and scrapes. In spite of green drivers and all the other tough operating conditions, these Arrow Clearance Lamps stay put. Available with either red or amber lenses, they provide good visibility and comply with I. C. C. and State Regulations.

There are sturdy Arrow lighting devices to meet every lighting requirement. See your nearest Arrow jobber or write direct.

ARROW SAFETY DEVICE CO.
MT. HOLLY, N. J.

3 RECAPS, AND CARCASS STILL PERFECT

says Pearce-Young-Angel Co.



Have the Pennsylvania dealer check your duals regularly with the scientific Pennsylvania "Match-Your-Duals" Gauge—a Pennsylvania service to save you money. For details write to Pennsylvania Rubber Co., Dept. CCJ-8, Jeannette, Penna.

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Silent Vacuum Cup Tire

Pennsylvania is one of several associated companies operating the Copolymer Corporation at Baton Rouge, La., the first plant to produce synthetic rubber for the United States Government.

514-A

CONTROLLING COLD ENGINE SLUDGE

(CONTINUED FROM PAGE 134)

sludge that effectively plugged the oil screen.

Up to a certain point, lubricating oils manufactured by the solvent extraction method are more resistant to emulsions, compared with the older conventionally refined oils. Oxidation inhibitors, however, should be used with the solvent extracted oils to provide additional protection against oxidation, without which objectionable deposits would be encountered and those deposits would be helpful in the formation of objectionable sludges.

4. Crankcase sludge may be carried to points in the engine system when accumulation of the sludge will result in engine failure. That presents a real hazard where the proper care has not been observed to assure a reasonably clean engine and when a fresh charge or another oil is put in service, which may result in the sludge material being moved from one place to another within the engine, and, at times rather quickly, in which event the blocking of the oil screen or the plugging of an oil passage may occur.

Experiences have been encountered, in which sludging or oil passageway plugging occurred, when an effective detergent oil was placed in service in a dirty engine that had been using a nondetergent oil or an oil of another type. Under such conditions, it is no longer unusual or surprising to encounter a troublesome condition because the effective detergent oil loosens up the sludge-coated interior of the engine. The sludge that has been loosened may cause trouble by the plugging of lines, oil screens and possibly oil rings. Such a condition would not have occurred if a detergent type oil had been used in a clean engine to start with. On more than one occasion, however, an erroneous conclusion has been formed that the detergent type oil was at fault. We want to emphasize the point that when a change is made to a detergent type oil it is highly important that the engine be thoroughly cleaned as a precautionary measure against the type of condition just mentioned.

The plugging of all rings by sludge or engine dirt is a subject currently discussed between representatives of the automotive and petroleum industries. There is a considerable amount of opinion that some engine designs and oil ring designs are more sensitive to fouling.

It is also agreed that oil quality is one of the major items contributing to fouled or plugged rings. Some are of the opinion that the proper use of a good detergent oil will minimize plugged ring difficulties. That opinion is based upon the belief that the sludge particles will be carried in suspension to the extent that objectionable deposits will be at a minimum. Others are of the opinion that greater sludge difficulties may be expected with a detergent oil because of the use of a metallic soap in the oil in securing the detergency effect that is considered necessary, more particularly with engines operating at higher temperatures and in which water contamination would be practically nil.

(TURN TO PAGE 140, PLEASE)

. . . Yes! It has what it takes to provide the vital upper cylinder lubrication that keeps your aging wartime motors young and healthy.

Marvel Mystery Oil has a fine record of success among America's big time fleets in heading off the troubles that result from inadequate lubrication in critical high heat engine areas. For, where ordinary lubricants fold up, Marvel Mystery Oil sustains its remarkable efficiency . . . it *reinforces* lubrication. Additionally, it retards the formation of power killing engine gums and varnish and allows rings and valves to function smoothly. Oil lines and pump screens benefit by its gum solvent qualities. Added to today's low octane gas it prevents fuel sludging, improves carbon condition.

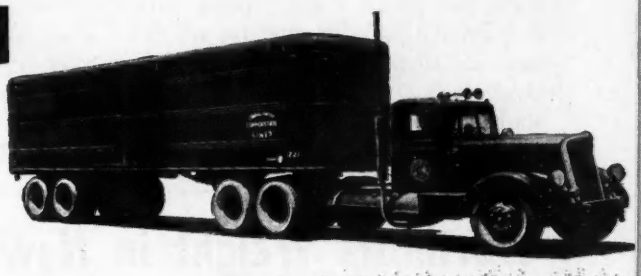
No wonder MARVEL MYSTERY OIL is in wide demand among thousands of maintenance-wise truck and 'bus operators . . . it is one answer to maximum motor efficiency and continued operation today. Ask us for the whole motor conservation story now. It will help to keep your payload units rolling and save repair parts and layup time for overhauls. Emerol Manufacturing Co., Inc., 242 West 69th St., New York 23, N. Y.

MARVEL MYSTERY OIL

and BUS Use ONLY!

You Need *Special* STRENGTH in a Truck BELT

Just as much as in a Truck TIRE!



No operator would even think of using a passenger car tire on a truck. Naturally not, because the loads are heavier, the service tougher. A bigger, stronger, more rugged tire is needed.

The moment you think of it you realize, of course, that exactly the same facts apply to belts.

A typical passenger car belt, for example, carries a 3.8 horsepower load. The belt on a regular truck must transmit 13 horsepower to turn the fan, pump and generator. And this is not all of the story. Trucks and Buses often use additional belt driven equipment. There may be vacuum pumps, compressors, airconditioning units and so forth.

On top of all, trucks and buses run longer hours—often 24 hours a day. They must change speeds as many as 600 times a day with rapid acceleration, abrupt deceleration, stops, starts and idling—all of which put a strain on truck and bus belts far greater than a passenger car belt ever has to stand.

Is it any wonder that big operators by the hundreds are turning to the one belt that is specially engineered for this extra heavy service—the Gates TRUCK Belt.

Read the letters reproduced on these pages. They tell you how practical, experienced, hard-headed operators are getting 50% to 80% longer belt wear since they began using the Gates TRUCK Belt. More important, they tell you how much valuable operating time they are saving through fewer road failures and fewer delays for servicing.

One thing we ask you to bear in mind. The Gates TRUCK Belt is sold for use on Trucks and Buses only. This is because some of the materials used are allocated for this particular purpose. Please do not use any of these belts on passenger cars. Truck and Bus transportation plays a direct and definite part in our nation's war effort.

• If you are interested in keeping your trucks and buses operating most efficiently and economically, call your jobber today and tell him to send you a trial order of Gates TRUCK Belts.

GATES Jobbers NOW Have Stocks to Serve You!

Hundreds of BIG OPERATORS say "50% to 80% Longer Wear"

LOS ANGELES, Calif.

"BEST EVER USED"

"In our heavy hauling from Arizona across desert and semi-desert regions with the thermometer frequently well over 100 degrees, we can run your Gates TRUCK Belt long after it would have been necessary to replace any other belt we have used."

Consolidated Copperstate Lines
R. C. Hutchison, Shop Supt.

SHREVEPORT, La.

"Your specially engineered TRUCK belt has eliminated fan belt worry. It outlasts any truck belt we ever used before by one-third or more."

Louisiana and North West Transfer Co.
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OUTLASTS ANY OTHER BELT"

NEWARK, N. J.

"Really tough service on our milk trucks played havoc with belts until we installed Gates Specially Engineered Truck Belts. We are now using only half as many belts as before—and saving a lot of time previously spent on belt adjustments."

Bloomingdale Dairy Co., Inc.
Edwin R. Fantel, Maint. Supt.

"CUTS COSTS IN HALF"

T444

GATES RUBBER Co

DENVER, U. S. A.
World's Largest Makers of V-Belts

CONTROLLING COLD ENGINE SLUDGE

(CONTINUED FROM PAGE 136)

Conclusion

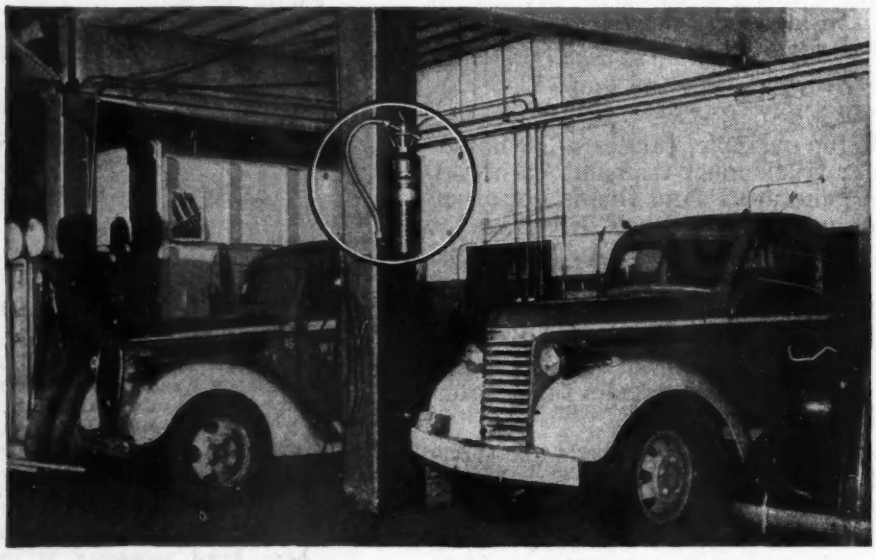
Good supervision in maintaining healthy or normal engine temperatures, the use of a good quality oil, in combination with effective oil filters, air cleaners properly serviced, observance of a sane crankcase drain period and the practice of draining the crankcase hot are the major items that can be easily used to advantage in controlling sludge problems. Those problems are due mostly to low temperature operations resulting in water contamination, the use of an oil of questionable quality generally because of price, greater mileages between crankcase drains, improper servicing of oil and air filters where they are used, and the practicing of cold crankcase drains.

Under some conditions a "heavy duty" type of oil (one containing agents that are both oxidation inhibitors and detergents) obviously can be used to good advantage. However, that should not be considered as a panacea for all ills because each fleet operation should have the benefit of individual study. A mild type of detergent oil may prove to be more desirable, or at least equally desirable than a regular "heavy duty" oil in the reducing of sludge troubles, and especially on those units and in such operations where unsatisfactory experiences have occurred in connection with effect of heavily loaded fuels upon valve operations. The use of the "heavy duty" oils is considered as supplementary only to items just mentioned in controlling sludging difficulties to a satisfactory minimum.

END

(Please resume your reading on P. 42)

Worth its Weight in New Motor Trucks!



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Garage fires often start fast. But they're quickly stopped when PLUS-FIFTY DUGAS Dry Chemical hits flames.

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Non-toxic, non-corrosive, non-abrasive—and has a long, effective fire-stopping range. Safe!

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• **CHART** showing characteristics of all types of approved hand fire extinguishers sent free on request.

MODEL 15-T HAND EXTINGUISHER

CCJ-H-3-44

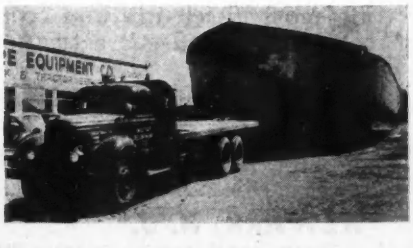
DUGAS ENGINEERING CORPORATION, MARINETTE, WISCONSIN

OWNED AND OPERATED BY ANSUL CHEMICAL COMPANY

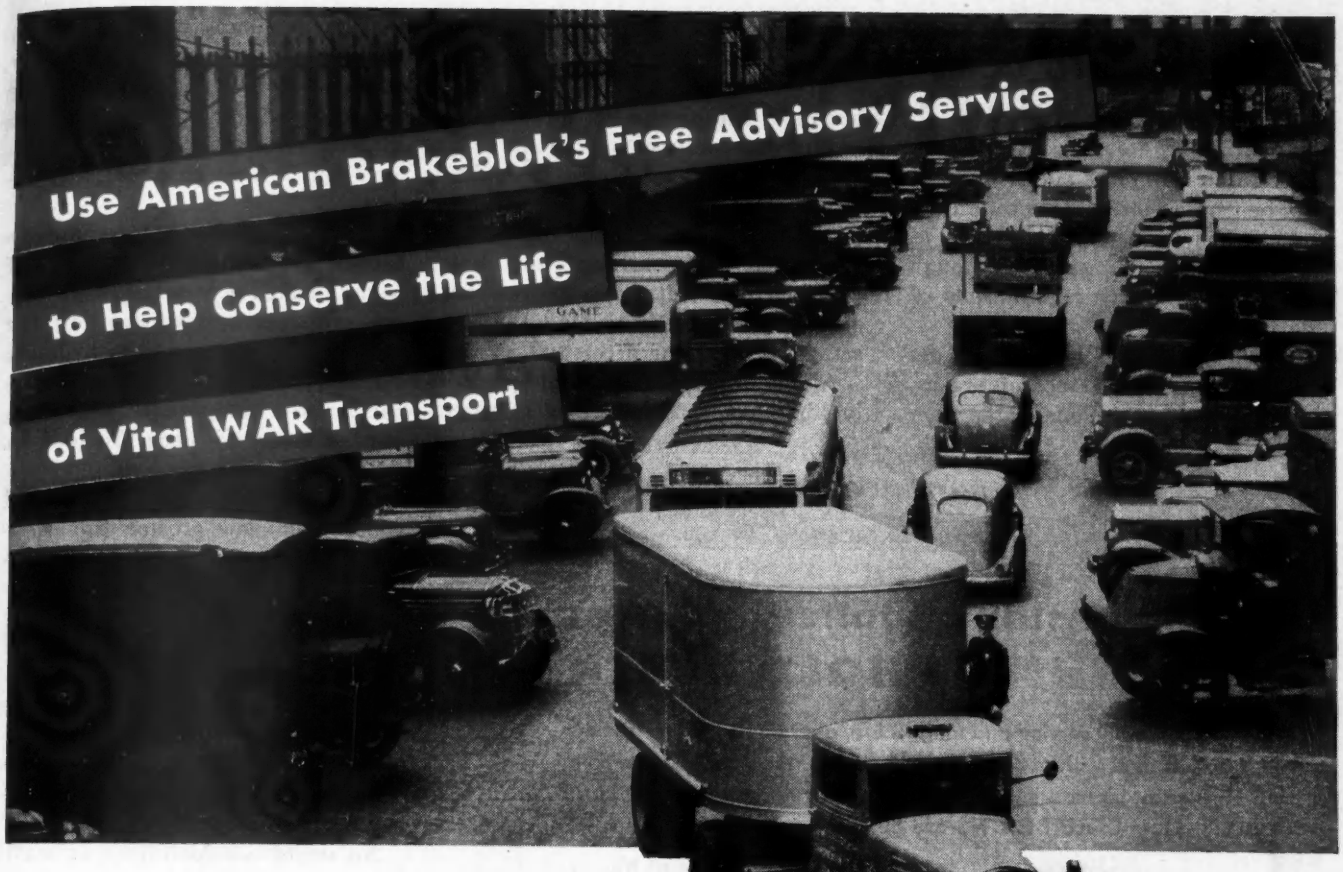
May Truckloading Up

The volume of freight transported by motor carriers in May increased 4.9 per cent over April and 4.1 per cent over May, 1943, according to statistics compiled by the Research Department of American Trucking Associations, Inc. The increase over last year's volume was in contrast with decreases in March and April under the comparable months of 1943.

Comparable reports received by ATA from 342 motor carriers in 47 states and the District of Columbia showed these carriers transported an aggregate of 2,876,902 tons in May, as against 2,743,557 in April, and 2,764,100 in May of 1943.



Total gross weight of this General Motors hauling unit is 147½ tons. The Model ADC-704 truck is powered by a Model 4-71 GM two-cycle diesel engine and is employed to haul YSD salvage ships on a specially built trailer. The ship weighs 250,000 lb., the trailer 30,000, and the truck 15,000, for a total loaded weight of 295,000 lb.



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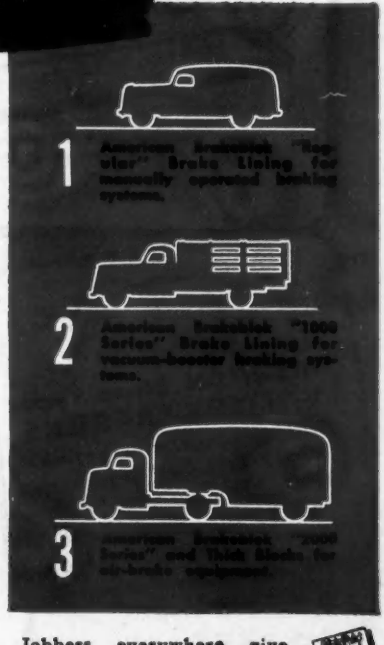
For each Truck . . .

Improves Service

Whether your trucking job is a light city service or heavy duty long distance haul—war transport must be kept moving, present equipment must work overtime to make sure of deliveries these days.

With three general types of long wearing brake lining and a world of experience as leaders in the brake materials field, Brakeblok engineers are ready for your toughest problem. This **FREE ADVISORY SERVICE** is producing outstanding results for many operators — in all parts of the country. Write direct to

American Brakeblok Division, Detroit 9, Mich.



"Stopper The Pup"—American Brakeblok's safe-brake messenger tells motorists about safe brakes in the national magazines every month.

Jobbers everywhere give prompt service. Master stocks in 37 NAPA Warehouses.

American Brakeblok BRAKE LINING

AMERICAN Brake Shoe COMPANY

CALLING THE TURN ON TRUCKS TO COME

(CONTINUED FROM PAGE 63)

Certainly still more effective means can be devised for keeping oil off the braking surfaces. The question is, can these things be carried far enough to meet the braking requirements of the future?

Much remains to be done in developing inherent balance of brakes, irrespective of variations in the traction on the different wheels. Some gain can be made in the accessibility of brakes for adjustment and renewals, for the lubrication of their mechanisms and for freer operation.

Controllability of brakes is doubtless susceptible of considerable improvement without departing from customary basic arrangement, but can all of these characteristics be enhanced sufficiently to meet the exactions of post-war necessity?

Already simplification of power braking has started. From a mere appliance to amplify the effectiveness of a system originally intended for manual operation, power braking has gone a good way toward integration into a genuine power braking system. But it must go a long way further.

It is high time that compressors became a part of engines, instead of being adapted accessories; that vacuum cylinders and valves, now that they have been married to hydraulic master cylinders, should become compact chassis components with standardized mounting pads provided for on standard transmissions.

With the inescapable trend toward wider rims and greater tire cross-sections necessitated by the unfortunate limitations of synthetic rubber and certain to be perpetuated by the need for lower tire pressures and fewer plies for the sake of lower operating temperatures at the higher speeds that are coming, it is a matter of serious question whether we can long continue to carry our service brakes on our wheels.

No doubt considerations of maximum safety will induce us to continue the hand brake in that location; but it is highly probable that before many peacetime years have passed we will have moved our brakes inboard.

Maybe some way will be found to extend the hubs inboard of the frame. Perhaps we shall adopt multiple disk brakes, inclosed in oil, within the rear axle housing and overhanging the steering knuckles inboard.

Again, we may go back to the driveshaft brake with either the wet-multiple disk, dry internal shoe or the external shoe type.

My prediction is that we will certainly take the service brakes away from the rear wheels, but that the front brakes, because of their relatively reduced duty and their superior cooling position will, for some time at least, stay where they are.

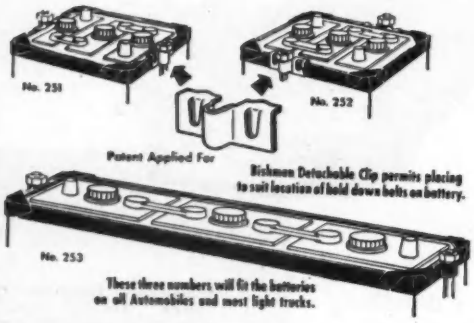
Of course, with a metal-to-metal, disk-in-oil type brake, operating at very high, balanced pressure, we may be able to so reduce the bulk of such a brake that room may be found for it wholly within the space encompassed by the tire, with piped connections to a convector remote from the wheel.

Whatever the shape of brakes to come, their characteristics must and

(TURN TO PAGE 146, PLEASE)

Don't Install a Battery Without A BISHMAN HOLD DOWN

To assure full service and longest life, every new battery should be installed with a **Bishman Hold Down.** With today's war-time batteries, it's most important to avoid jarring, rattling and wear. BISHMAN HOLD DOWNS are BETTER—entirely new principle.


No. 251
No. 252
Patent Applied For
Bishman Detachable Clip permits placing to suit location of hold down bolts on battery.
No. 253
These three numbers will fit the batteries on all Automobiles and most light trucks.

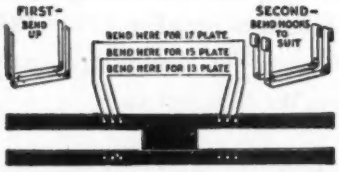
Made of heavy gauge steel—simple, sturdy, rigid.

Movable Clip Cuts Stock Requirements to 3 Sizes.

LOW COST

BISHMAN Strap Type BATTERY CARRIERS

Strong strap with permanently attached iron ends firmly press-locked. Manf'd under pat. license. No. 182, short type, No. 181, long type.



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Just bend where marked by holes, to fit most cars—no tools needed. Made of 16-gauge steel—strong, rigid. No. 230, weight each 1½ lbs.—25 to bundle.

ASK YOUR JOBBER
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BISHMAN

AIR – VACUUM – HYDRAULIC

We are speaking of brakes...brakes for the buses, trucks, trailers and tractors of today and tomorrow. Brakes that will best fulfill your requirements, give you maximum performance, safety, dependability and economy.

Obviously, you don't want to buy air brakes if vacuum will better serve your needs—nor vacuum brakes if hydraulic provide the correct solution to your braking problems. Obviously, too, you will get better answers to your brake questions from an organization that builds all three—*Air, Vacuum* and *Hydraulic.*

AAC Brake Engineers are at your disposal—to consult with you on your brake needs and recommend the type of equipment which will best meet your requirements. Address inquiries to

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CALLING THE TURN ON TRUCKS TO COME

(CONTINUED FROM PAGE 142)

will exceed the reasonable possibilities of present basic design.

Brake fade must be licked. Brake balance must be maintained. It will not be enough that the braking force must be equalized between the two sides. It must be self-adjusting to differences in traction on two sides.

Fore-and-aft proportioning, similarly must not be a fixed quantity. It must be self-adjusting in the same manner, particularly as regards the rather large differences in proportionate loading as between the light and loaded condition and on varying gradients.

Desirable, too, if not strictly a must, is some inertia control to avoid that tow-stubbing action at the end of braking when the driver lacks finesse. Subway-train stops are particularly to be avoided in buses and in trucks with fragile loads.

Just as in the clutch, we must boldly strike away from the limitations inherited from manual operation. With practically unlimited available actuation pressure, we can replace high-coefficient friction surfaces for sterner stuff and reduce the frequency of both adjustment and refacing, so that the brakes can retain a high potency for long periods, unaffected by climatic changes and free from fade.

Of course, there is another path to take, if we chose. That is to devise automatic adjusting means and such ease of relining that short-lived, high-coefficient linings may be adapted to our needs for a long time to come. The issue will be decided, of course, on the cost sheets and in the preferences of buyers.

We must, we will have better brakes—and soon.

Cab and Controls

Driver comfort and convenience is now an established objective, not solely on humanitarian grounds, nor yet mainly as an aid in employee relations. On grounds of safety, efficiency and economy, the easing of strain, both physical and nervous, is good business.

Luxurious as those of yesterday seemed, the post-war cabs will far excel them. Full-adjustable driver's seats are as necessary as adjustable rear-view mirrors and for the same reason: Because leg-lengths, trunk-lengths, neck-lengths and arm-lengths are not and never will be standardized.

Even if eugenics might bring forth uniform human dimensions in the future, adjustable seats would still be desirable for the sake of the easing of strain obtainable by slight variations in posture. Future driver's seats will not only adjust forward and back, but vertically as well, with the pitch of the back-rest variable as well.

Ventilation must be improved—particularly for summer comfort. Heaters will be arranged so that in summer they will induce a cooling circulation of fresh air where it is needed most—about the driver's feet.

The opening windshield will surely disappear. It is the worst ventilating device in the world. It is a perfect trap for stinging insects and almost impossible to make rain-

(TURN TO PAGE 150, PLEASE)

Preview of new items
IN THE EBERHARD CATALOG
NOW BEING COMPILED

• Now in preparation is a new edition of the EBERHARD Catalog containing many new and improved items for better service to the trucking industry.
• Here is a preview of a few of these items.
• Register your name for a copy of the catalog.

No. 4875—Key Locking "RECESSO" lock, one of a complete line of compact locks with recessed plates and folding handles.

Adapted for quick, easy attachment by bolts, screws or welding to compartment doors of tank and utility bodies.

No. 5637—A new item in our line of "big van" locks so popular for many years.

Equipped with handle for inside locking only.

No. 4844—A sturdy Key Locking Handle for utility bodies. Has a built-in push plunger. Turn key to unlock. Simply push plunger to lock.

No. 4873—A larger and more rugged Cab Lock. Has extra large bolt and hole for 5/16" square handle shank.

No. 5616—Handle for inside installation. Fits 5/8" square shank and is fitted with set screw.

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Battle-front Refrigerators

ON WHEELS!

Acme Photos

The Waukesha Portable Cooling Unit mounted in front trailer compartment. Under-body installation also provided to give maximum cargo space.

● It isn't *always* K rations up at the front lines. Not when these G. I. refrigerators go rolling along. Here are some of them on the move in the European area.

No matter how long the supply line to the front may be, their loads of fresh meat and green vegetables, life-saving blood plasma and other precious medical stores will arrive in prime condition. The Waukesha Engine-Driven Refrigeration Unit takes care of that. Dependability is built in—and how well Waukesha *knows how* to build it in.

Waukesha *know-how* was gained from years of building mobile engine-driven air conditioning and refrigeration equipment. Equipment that proved its dependability over millions of railway and highway miles—despite constant variation, sudden changes and wide extremes of temperature.

Today all Waukesha *know-how* goes into the war effort—and all Waukesha production goes to the armed forces. After the war Waukesha mobile engine-driven refrigerating units . . . still further proved *and* improved . . . will be ready for mobile commercial applications of every type.

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS. • NEW YORK • TULSA • LOS ANGELES

MORE POWER FOR VICTORY

WAUKESHA ENGINES

CALLING THE TURN ON TRUCKS TO COME

(CONTINUED FROM PAGE 146)

tight. The bottom-mounted wiper is by all odds superior to the top-mounted one and requires a fixed windshield.

Much improvement is indicated in cab doors. Truck driver's feet are proverbially big. There must be room enough between the front of the door opening and the seat riser, even if it does disturb the external symmetry to slant to the bottom of the door forward or make a forward offset in it.

Sturdier sun-visors are required, so formed that they cover the space above the center. With these, the windshield can be raised high enough to afford long-waisted drivers good vison without stooping.

It is doubtful if metal toe and floorboards will persist for long. They are too infernally hot in summer and frigidly cold in winter. Modern resinbonded plywood gets my vote.

Maybe tomorrow's cabs will not have coach doors. I don't like sliding doors, but there are several other ways of hanging a door so that it gives an unobstructed opening of sufficient width without swinging so far out. There is a particularly clever arrangement being worked out.

Very little of radical nature can be anticipated in controls. We shall have a gearshift lever so long as there are gears to shift—even if we shift them by power. It will probably sprout from the steering column (where Pierce-Arrow put it 30 years ago) now that all passenger cars have it there.

The three pedals—clutch, brake and throttle—may give place to two treadles. The brake treadle will be on the left and the throttle on the right.

The hand brake alongside the seat—to its right of course—will gain popularity because it is more out of the way and in that position gives the driver much more effective use of his muscles.

The foot button beam switch on the left floorboard is undoubtedly a fixture and save for the need for greater accessibility for the light switch, the control pulls on the instrument board seem to be satisfactory.

The control for the turn indicator, which will probably develop into blinking tail-lights and parking lights, as in automobiles, will preferably follow passenger car practice and take the form of a small lever above the gearshift lever. The useless and ineffective tell-tale light on the instrument board will give place to a loudly-clicking flasher relay to remind the driver when he leaves it on after rounding a turn, or else a steering-wheel-operated shut-off will also be borrowed from our pleasure car friends.

The direction in which improvement in controls are to be looked for is less in type than in placement. There is a great need for careful study of such things as steering column angle, strike and direction of pedals and levers and dimensional relationships of the controls.

If drivers are to be discouraged from riding the clutch pedal, then designers must provide a comfortable

(TURN TO PAGE 154, PLEASE)

REDUCE Operating Costs . . .
PROLONG Engine Life . . . with

POW-R-FLO
THE SUPPLEMENTARY LUBRICANT

REDUCE SLUDGE—by adding POW-R-FLO to the lubricating oil, as prescribed. It keeps sludge *in suspension* in the oil for easy removal by regular oil filter. It also INCREASES the FILM STRENGTH of the oil to which it is added.

IMPROVE TOP CYLINDER LUBRICATION—by adding POW-R-FLO *regularly* to the gasoline or other fuel. Even if you have top oilers, POW-R-FLO will keep pistons, rings and valves CLEANER, and BETTER LUBRICATED.

REVITALIZE Sluggish Engines (due to gummy deposits) by running POW-R-FLO through the carburetor or intake manifold, as directed, to clean out deposits and free sticky valves and rings. Also ideal for running in rebuilt or new engines.

HARMLESS to Engines—no matter how much is used. Yet small quantities, used regularly, *do a real job!* POW-R-FLO is a super-efficient internal engine lubricant with an effective detergent action on the gummy deposits that cause most engine troubles. It's a pure, treated mineral oil—free of all impurities—heat-resisting and with HIGH CAPILLARY action, reaching close tolerance and super-heated surfaces. Also improves catalytic action for better combustion.

TESTED and PROVED in every type of internal combustion motor. Packed in 2 qt., 1 gal. and 5 gal. cans—also 15, 30 and 55 gal. drums.

Write for full information.

The Mauston Corporation — WINONA MINNESOTA

Use postage-paid card inserted in this issue for free information on advertised products

MILITARY MILES—AVAILABLE NOW!

Hydrovac

POWER BRAKING BY

Bendix

For War-Essential Trucks, Tractors and Buses

Here's a quick picture of the most thoroughly proved new product ever offered the automotive field—the outstandingly simple, sturdy and efficient Hydrovac power braking unit, designed and built by Bendix—*brake headquarters for more than thirty years.*

In design, the Hydrovac power braking unit is small, compact, and completely enclosed against dirt and water. *In installation,* the unit is simplicity itself. It can be located any place on the chassis as the mounting brackets are never required to withstand loads due to reaction from brake applying forces. There are no external levers, and only three tubing connections are needed. *No adjustment* is necessary either at installation or later in service.

That's good news, and here's more: Hydrovac power braking is available *right now* to qualified wartime users! Check over the list of important advantages at the left, judge its exceptional worth for yourself—then see your Bendix B-K dealer, or write the factory direct.

BENDIX AVIATION CORPORATION

CALLING THE TURN ON TRUCKS TO COME

(CONTINUED FROM PAGE 150)

place, other than on the pedal for the driver's foot. There is need for an adjustable heel rest for the right foot, so placed that the foot can be swung from accelerator to brake pedal easily without lifting the foot. There must be knee room under the wheel and the accelerator treadle should be wide enough to permit alternative positions of the foot to avoid cramping on long drives.

Tires

Never again is the truck industry likely to undergo so thorough a revolution as that precipitated in the twenties by the pneumatic tire. That revolution, however, was not a matter of an overnight change. It is still in progress and the end is not in sight.

Even had the epochal impact of a throttled rubber supply not struck us, the rapid changes in carcass structure, cord material, rim width and contours and tread design nevertheless would have sharply influenced post-war truck and bus design.

As a war measure we may be granted an overall width of 102 in. at the tires and thus be able, not without some difficulty, to fit tires of wider cross-section. Perhaps such a liberalization might become permanent. If not, then we are in for some rather fundamental changes in basic chassis design.

There is a way, of course, of narrowing our frames and still maintaining stability. We can also place our tires one behind the other, as in six-wheelers, instead of abreast. But make no mistake about it—once larger cross-sections and wider rims arrive, we will never return whence we came.

In return for this newest of innovations forced upon us by the pneumatic tire, it is to be hoped that those who build them will grant the boon so long and earnestly sought by the SAE, namely, a simplified line of tires whose capacities are more happily graduated than in the past.

Accessories

What this country needs is a good reliable gadget that will sound an alarm when tire pressure drops 5 lbs.—and a truck quiet enough so you can hear it!

That's not a prediction, it's just a wish. I do predict certain accessories, however, because they are needed and the means of attainment well known:

One of these is a set of instruments which, instead of moving tiny hands over dainty dials will sound a buzzer whenever anything is wrong. This buzzer can be so wired to a selector dial that it will stop buzzing when the knob is turned so the indicator points to the trouble.

Certainly a simple enough circuit is involved, and by making it a closed-circuit operation, any derangement in the wiring will start the buzzer sounding.

Such an alarm system will make no demands upon the driver's attention—(and how many drivers bother watching the dials anyway?) until something goes wrong.

When it starts the buzzer, the driver will naturally dial it out to

(TURN TO PAGE 157, PLEASE)

The Servis Recorder
Saves . . .
TRUCKS
TIRES
GAS
TRUCKS ARE SCARCE!
All right, then every truck must work harder—must do more work. Make five trucks do the work of six. Let the little SERVIS RECORDER help you. "One pound of Servis Recorder can and often does save half a ton of truck." No, there's no mystery about it. Increase the actual running time of the truck only 45 minutes a day, and there you have it!
TIRES ARE SCARCE!
Speeding doubles the wear and tear on tires—a waste of precious rubber. Equipping a truck with the SERVIS RECORDER helps prevent speeding by taking away the driver's incentive to "step on it."
FUEL IS SCARCE!
The Servis Recorder helps you save gasoline, too. Speeding wastes a lot of gas—and gas is almost as scarce as rubber. Let us send you the whole story—write us today.
THE SERVICE RECORDER CO.
1375 EUCLID AVE., CLEVELAND 15, OHIO
The Servis Recorder
Is a Wartime Economy

CALLING THE TURN ON TRUCKS TO COME

(CONTINUED FROM PAGE 154)

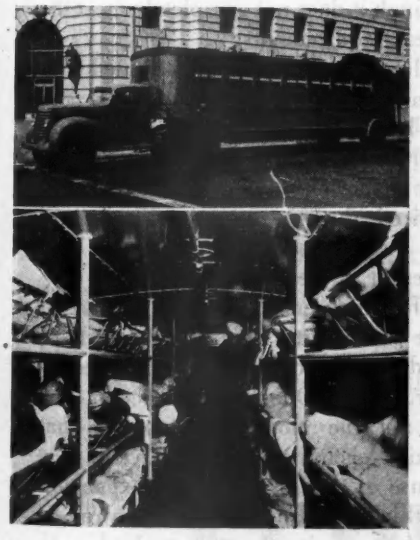
stop the racket and when he does, he cannot escape warning. The dial might be spring-returned so that the silencing of the buzzer will last only so long as the driver holds the indicator at the right spot. When he releases the knob, it will return to the "Normal" indication and the buzzer will continue to sound until he opens the ignition switch or remedies the trouble.

It might indicate all or any number of the following:

Low oil
Low gasoline
Low water
Low battery electrolyte
Low battery charge
Low oil pressure
Low air pressure
Low water temperature
High water temperature
High oil temperature
High speed (over a set limit)
High engine speed (as in coasting in gear).

END

(Please resume your reading on P. 64)



Wounded Navy men from the Pacific area are now transported from ship to hospital in this new 20-patient ambulance, converted from a 100-passenger semi-trailer bus. The power unit is a Diamond T Model 614 tractor, and the capacity of the new vehicle is five times that of the largest Navy ambulance previously used. Four hospital corpsmen accompany the patients en route from dock to hospital, with plenty of room to get around among the patients, as shown in the interior view.

GALION
HYDRAULIC DUMP BODIES
the dependable equipment
for completing the nations'
SUPER HIGHWAY PROGRAM

For Extra Service Equip Your Truck with GALION Hoists and Bodie
THE GALION ALLSTEEL BODY CO. • Galion, Ohi

MANUFACTURER VIEW OF OPERATORS' WANTS

(CONTINUED FROM PAGE 43)

vided to promote efficient radiator action.

7. The system must be constructed and maintained to keep coolant loss to a minimum.

8. The surfaces from which heat is transmitted to and extracted from the water must be kept clean.

9. The surface from which heat is extracted by the air must be kept clean.

Number 1 can be obtained by reducing the effectiveness of the radiator.

This can be accomplished by reducing the air flow through the radiator, either by blocking the radiator or changing the fan action. Blocking the radiator can be accomplished by a shutter or the makeshift methods so aptly described by Mr. Laurie. The action of the fan can be modified by a clutch drive capable of being engaged or disengaged by a variable pitch fan, or by disengaging the fan belt. Either method can be made so as to be either manually or automatically controlled. The objections to these methods are that the water is circulated through the radiator and air flow cannot be completely eliminated by reason of car speed or leakage. Furthermore, the increased mechanism suggests more troublesome maintenance, as well as increased cost.

Another means of accomplishing this desired result is to reduce or eliminate the circulation of the water through the radiator. The water flow can be shut off by a control valve in the engine outlet pipe which can be controlled by a thermostat. The preferred construction is one in which a bypass from the engine outlet to the pump inlet is provided with a valve in the engine outlet located between the bypass and the radiator and another valve in the bypass pipe, both controlled by the thermostat. When the main valve is closed, the bypass is fully open and as the main valve opens, the bypass valve closes. This arrangement prevents the cold water which is lying in the radiator from entering the engine jacket in a gulp when the valve opens. This system seems to offer the most practical answer to this problem presently available, although it does not completely meet the ideal requirements.

Requirement 2 can be attained with same means discussed under 1.

There is no need to discuss requirements 3, 4, 5 and 6 here. With the experience which has been acquired, there is no excuse for failure to meet these requirements in any present day engine or vehicle.

Requirement 7 seems to be one of the points with which operators have had the most difficulty as evidenced by Mr. Laurie. One major source of loss, if not the most important, is that which occurs through the vent. The cause of this loss is due to expansion within the normal temperature range, turbulence in the top tank due to agitation produced by water entering from the engine and car motion, and everheating which causes ejection of water.

Closing the system with a cap equipped with a blow-off valve will reduce the losses due to expansion and eliminate those due to surge, and

(TURN TO PAGE 160, PLEASE)

Convert MEDIUMS TO HEAVIES

● A 3½ - 4 cu. yd. mixer is a load for a heavy duty truck. **Fabco Dual Drive** converts your truck to haul this type of load with the minimum use of critical materials. And you get twice the tractive effort by the positive drive on the two rear axles. The transfer case has an underdrive gear for the tough going, and a throw-out clutch for the third axle to give free-wheeling on the highway. Ask us for the name of your nearest Distributor.

25 Years in this Business

Fabco

F. A. B. MANUFACTURING CO.

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Dual Drives · 6 and 10 Wheel Units · Logging and Highway Trailers · Frame Extensions

Here's Where the Trouble Starts!

And here's where Trouble Starts on an Oil Pumper

Don't wait until it's too late! At the first sign of oil pumping—check for connecting rod bearing wear. Worn bearings force excess oil into cylinder assemblies where it burns to carbon on pistons, piston rings, spark plugs and valves—endangering hard-to-get metal parts—and leading to costly crankshaft damage. Bearings are a critical, war-needed material to be used wisely, but if replacement is necessary—install Federal-Mogul Oil-Control Bearings to restore engine efficiency.

OUR INCREASED WAR EFFORT WILL SAVE LIVES!

Every day our fighting men are increasing their war effort with the hope that those at home are keeping our cars, trucks, buses and tractors rolling with war materials, workers and food. You can help by staying on the job. Remember, *just any pair of hands can't replace your skill.* We do all we can to supply your service bearing needs. Let's work together for victory!

• • •

FEDERAL-MOGUL SERVICE • DETROIT 1, MICHIGAN

DIVISION OF FEDERAL-MOGUL CORPORATION

***When Necessary* Replace With Genuine**

FEDERAL-MOGUL

Oil-Control Bearings

MANUFACTURER VIEW OF OPERATORS' WANTS

(CONTINUED FROM PAGE 158)

will do a fair job on passenger cars and may likewise prove satisfactory on light trucks. The most complete answer is to provide an expansion tank with provision for return to the system of water forced over and condensate which accumulates, This expansion tank incorporated as an integral part of the radiator seems the most desirable arrangement, although it may present some problems in providing the room necessary to house it.

The next cause of loss is leaks which may develop at various points in the system. The most serious is, undoubtedly, at the pump shaft. The conventional method used for sealing this joint has been a compression packing behind a gland. This construction has left much room for improvement. Pumps of this type have generally been made with plain bearings which perform satisfactorily provided no radial loads are imposed by gear or belt drives. The packing being dependent on compression to make the seal naturally develops heat even when adjusted properly, and when maladjusted, as is too frequently the case, develops enough heat to remove the lubricant which is carried in the packing. This leads to scoring of the shaft and creates a condition which can be corrected only by a complete overhaul. Furthermore, the bearing requires normal lubrication and under conditions just cited needs more, which means continuous attention to the grease cup usually provided, as well as seeing to it that the proper high temperature grease is used. When bearings and packings are worn and the shaft scored and the operator tried to make grease keep things going, an excessive amount of grease is forced into the coolant and this promotes deposits in water passages that are detrimental.

There are now available pumps equipped with ball bearings and seals which are being used by several manufacturers and which have eliminated these difficulties. The bearings are sealed and in some cases no provision is made for lubrication, and in others lubricant in the form of a standard grease can be applied at relatively infrequent intervals.

The cylinder head gasket is another source of leakage that can be troublesome if not properly designed or applied.

Finally, the hose connections are responsible for considerable trouble. The flexibility which must be provided to accommodate the motion developed in the system by engine movement, and chassis distortion makes the use of hose connections essential. The clamps which are generally used are not ideally suitable for the function they must fulfill in that they fail to provide a uniform clamping action around the full circumference of the hose. This produces wrinkles and promotes leakage that calls for tightening to correct. In time, the creep and setting of the hose reduces the clamping effect and tightening is necessary. Hose should not be applied to iron fittings without a tin or lead coating and care should be taken to have an adequate

(TURN TO PAGE 162, PLEASE)

CHECK YOUR JOBS FOR HIGHER DRIVER S.Q.* TO MAKE VEHICLES LAST LONGER

EXCLUSIVE ASBESTOS-FRICTION COMPOUND MOLDED ON WIRE-GRID BACK
CONSTANT HIGH CO-EFFICIENT OF FRICTION THROUGHOUT LONGER LIFE
ASTONISHING FREEDOM FROM ADJUSTMENT
PRECISION MACHINED FOR QUICK INSTALLATION
QUICK STOPS . . . . BUT SMOOTH . . . . . AND WITH SOFTER PEDAL
MOST EFFICIENT BRAKING PERFORMANCE UNDER ALL CONDITIONS OF SERVICE

● Make no mistake—sacrifice no needed quality! Be sure that your service produces *safety*—raises *your* drivers' ✱ *Safety Quotient. Use GRIZZLY*—finest product of the brake lining industry—to obtain *every* essential quality that assures extra-safety for your drivers and your equipment. Write today for the name of your nearest Grizzly Distributor. Grizzly Manufacturing Company, Paulding, Ohio. Plants in Paulding and Los Angeles.

"Bear In Mind"

GRIZZLY
REG. U. S. PAT. OFF.
BRAKE LINING

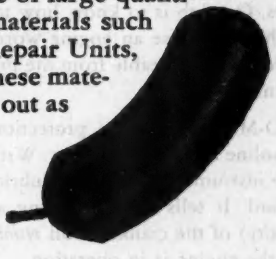
WHEN *Good Things* ARE PLENTIFUL AGAIN

SOME DAY we will again buy our favorite tires from our dealers without need for rationing permits. It is natural that these "favorite" tires should be the same kind that gave us good service before the war.

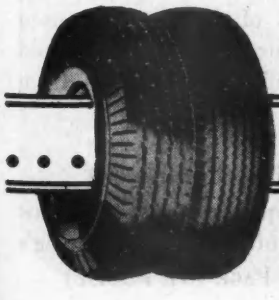
Some companies make more tires than Mohawk. None, though, have consistently turned out more dependable quality. Both management and dealers believe this Mohawk service will be remembered when tires can be purchased freely again.

Mohawk Tire Building Materials

One of Mohawk's contributions to the war effort is the manufacture of large quantities of tire rebuilding materials such as air bags, Free Flex Repair Units, recapping stock, etc. These materials are being shipped out as fast as they are made.



The Mohawk Rubber Co.
Akron 5, Ohio



. . . MOHAWK *Quality will be Remembered*

MANUFACTURER VIEW OF OPERATORS' WANTS

(CONTINUED FROM PAGE 160)

lap of the hose over the pipe or fitting.

Naturally, provision should be made to enable the operator to inspect and maintain these parts with a minimum of difficulty. Unfortunately, recognition of this need is not always reflected in the vehicle, but this may not mean that the matter was not considered. Frequently, other requirements which seem more important conflict and the resulting compromise may have been made unwisely.

Items 8 and 9 are almost entirely in the operator's hands. There are radiators with excellent cooling characteristics which are hard to clean. Certainly the use of cores which have very restricted water passages are to be questioned for use on trucks. Rust inhibitors and water conditioners undoubtedly have not been used as frequently and effectively as might be desirable.

In the engines, the use of clean-out holes are desirable from the standpoint of keeping the jackets clean, but introduce a serious hazard to the block. It has been found that such openings with their covers and screw holes promote leakage unless the holes are tapped blind into bosses. These bosses and the flanges cause uneven expansion and develop stresses which cause cracking in jacket walls. For this reason, there is much to be said for limiting the openings to the smallest number and size needed for supporting the cores.

The writer believes that better and more practical results can be obtained by paying attention to design and construction details outlined than can be obtained from level indicators. The provision of a petcock is not difficult and if it serves a practical purpose as seems probable from Mr. Laurie's discussion, would be warranted. The use of a sight glass as suggested would seem to introduce a hazard that is not compensated for by the utility of the device. The use of any float type indicator, judging by the accuracy which can be obtained from fuel gages, would not be acceptable and probably would only introduce another item needing maintenance.

Steam cooling seems to offer a number of attractive features, and at least as many problems. The large quantities of heat that can be absorbed in steam and liberated in condensing give promise of obtaining a great improvement in the efficiency of the system. It would also seem to be possible to get quicker warm-up and operation within a narrower temperature range. The problem seems to center around an effective means of permitting separation of the steam from the water and getting it into the condenser. Another problem is encountered in providing protection against freezing. Without going into this in detail, it would seem that mixtures of the generally used anti-freeze materials and water would have quite different properties from water alone.

Electrical Equipment

Electrical equipment seems to draw a great deal of fire in Mr. Laurie's

(TURN TO PAGE 164, PLEASE)

LOST...TO THE SERVICE OF

135,000,000 AMERICANS!

Whenever a gasoline or diesel engine is all washed up because of lubrication neglect, every American suffers a loss. We won't go into the causes of lubricating oil failures. Our job is to know how to prevent them, because an engine worn out, is no longer replaceable from the production line.

VISCO-METER* does a protection job on gasoline and diesel engines. With this simple instrument you have a lubrication safeguard. It tells the lubricating ability (viscosity) of the crankcase oil *visibly* and while the engine is in operation.

VISCO-METER* offers the one dependable means of making sure of safe, efficient and adequate engine lubrication.

Only VISCO-METER* can warn in advance of failure...preventing damage and loss of service. So the VISCO-METER* is important not only for automotive vehicles, but on any gasoline or diesel engine.

If you design, produce or use internal combustion engines of any type, why not request that a VISCO-METER* engineer call on you to tell you the *whole* story? Write today.

VISCO-METER

CORPORATION GROTE ST., BUFFALO 7, N. Y.

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THE WEATHERHEAD "LINE":

Fittings

Fuel Lines

Dash Controls

Drain Cocks

World's Largest Manufacturer of Fittings and Flexible Hose Assemblies

•

The WEATHERHEAD COMPANY
Cleveland, Ohio

"They say he has a wonderful 'line'—
he must be a Weatherhead Salesman!"

MANUFACTURER VIEW OF OPERATORS' WANTS

(CONTINUED FROM PAGE 162)

paper, and he says it cannot be dismissed by simply agreeing with him. There is not such a great deal of mystery attached to the relatively poor quality of this type of apparatus. The answer is that the big market for this equipment is in the passenger car field where the quality is adequate for the service required. As soon as the attempt is made to obtain something not made for that market, the difference in cost is out of all proportion to the difference in quality. This, of course, is due to the powerful influence of volume on costs. This presents a problem, the answer to which is not presently evident.

The quick glance that discloses the tangled mass of wires to which reference is made as providing proof of haphazard workmanship also gives rise to a nostalgia in the designer's breast for the good, old days when a lot of things to which wires are connected were not considered essential. However, we are stuck with these things and instead of receiving any sympathy for simplification, the demand seems to be for more. Probably we must admit that there are a lot of bell wire applications to our electrical systems which the operating men know about and object to, but, on the other hand, in many cases the buyer gives no consideration to this or many other cost items when the purchase is made, but simply looks at the price. Naturally, these comments do not apply to everyone on either side of the fence, but they do apply in too large a number of cases.

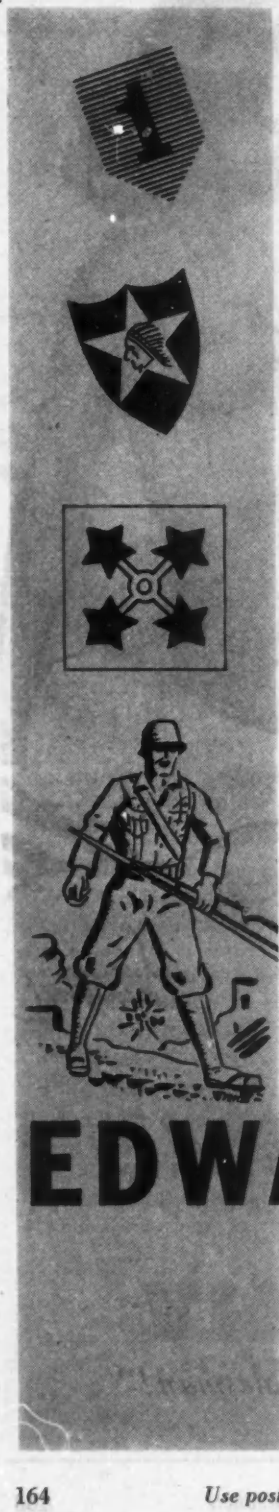
Unit Replacement

It is a little difficult to understand exactly what is meant by the discussion Mr. Laurie gives on unit replacement. The paragraph heading might lead to the inference that all units are included, while the discussion is limited to consideration of the engine. Further, without being explicit, the implication seems to point to an expressed desire for designs which have the engine mounted on a subframe or tray that can be pulled out.

There are several different angles from which this problem can be considered. One is that repairs are necessary and unavoidable, and that in consequence, accessibility and the convenience and facility with which units can be removed or repairs made are of primary importance. The other view is that vehicles should be made to run and not to be repaired as a primary consideration. To this end, the main effort is exerted to construct the vehicle and its units so as to provide a maximum interval between repair and overhaul operations. If this can be accomplished, even at the sacrifice of accessibility, then possibly the increased labor required for the whole operation will not be out of proportion to the increased life which has been procured.

In too many cases, the provision of constructions that facilitate quick uncoupling and removal add complications, weight, wearing parts and cost which make their usefulness highly questionable. At the risk of getting his ears pinned back, the writer will

(TURN TO PAGE 166, PLEASE)



KNOW THESE?

The Germans Do.... WELL!

★ These are insignia of U. S. Infantry . . . "Queen of Battles".

They belong to the 1st, 2nd and 4th divisions. On their colors they carry the names of old battles . . . Cantigny . . . Belleau Wood . . . Chateau Thierry . . . St. Mihiel . . . Soissons . . . Blanc Mont . . . The Argonne. In every one they met the Germans before the present war, and never failed to impose their will.

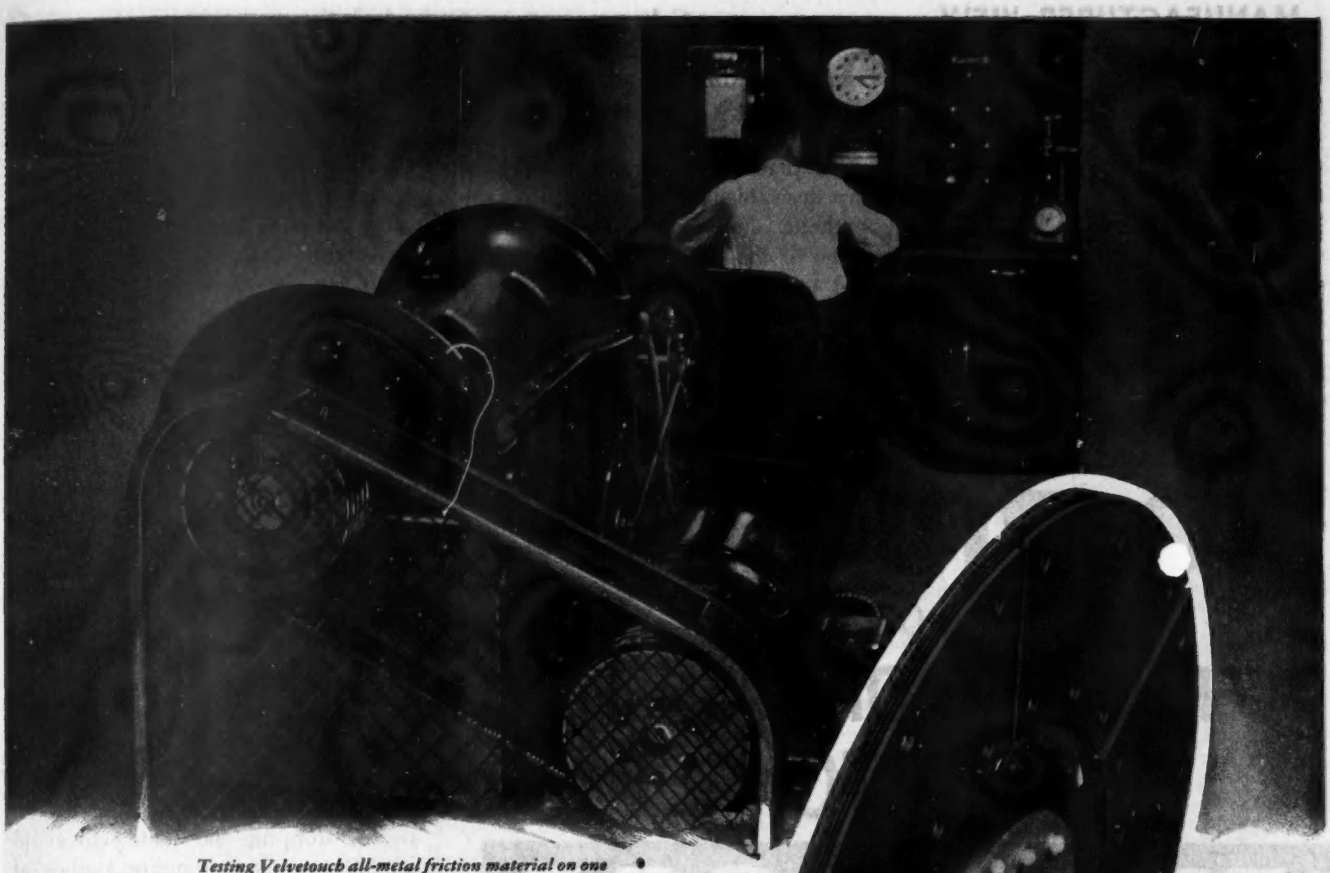
If the Germans have poor memories they have had occasion to rue their forgetfulness. Troops from some of these American divisions helped chase Rommel out of Africa, captured Sicily and landed on the beaches of Italy. Now they're back in France . . . on the fields of Normandy.

Keep your eye on the Infantry—the doughboy does it.

EDWARDS IRON WORKS, INC.
SOUTH BEND, IND.

EDWARDS SEMI-TRAILERS

Edwards is making a sincere effort to contribute its small share in helping these troops . . . and all of the United Nations . . . with the materiel they require. Semi-trailers for combat use are, naturally, included.



Testing Velvetouch all-metal friction material on one of the dynamometers in the Wellman laboratories.

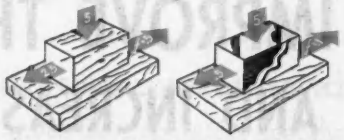
...to give you BETTER friction materials

The large and well equipped Wellman laboratories are devoted exclusively to testing *rubbing surfaces.* With many different types of dynamometers and much other specialized equipment, our skilled engineers are engaged in continuous study of powdered metal friction materials. The result: Velvetouch clutch facings and brake linings give you the utmost in dependable performance and long wear. Specify Velvetouch for replacements in heavy-duty buses and trucks.

THE S. K. WELLMAN COMPANY
1374 East 51st Street • Cleveland 3, Ohio

Interesting facts about Friction

Whenever a pair of surfaces rub together, friction is developed which tends to retard the motion. Friction between like bodies is greater than between unlike bodies, hence the reason for steel shafts housed in bronze journals.



Hard wood rubbing against hard wood under certain conditions would have a coefficient of slightly less than .5. On the other hand, lubricated wrought iron on hard wood under the same conditions would have a coefficient of less than .1.

The powdered metals in Velvetouch are combined in a wide variety of "mixes" to give you just the right friction qualities for each installation

FOR BRAKE AND CLUTCH USE **Velvetouch**

MANUFACTURER VIEW OF OPERATORS' WANTS

(CONTINUED FROM PAGE 164)

make the statement that every so-called removable power plant he has even seen falls in this category. It would appear that it should be possible to capitalize the better knowledge and the improvement in materials to produce vehicles and units with longer life and greater simplicity and lower weight and cost than the reverse.

Cabs

In closing this part of the discussion, recognition should be given to Mr. Laurie's remarks concerning cabs. The writer is in general agreement that the requirements outlined are desirable, particularly since sympathetic understanding is given to some of the problems involved. The last ten years or so before the war were a period during which many developments started. It was in this time that the C.O.E. models came into general use and also the time in which the matter of appearance was given more consideration. It can be admitted that these new styles were not developed as completely or satisfactorily as is either desirable or possible. This work has, of course, been interrupted and retarded by the more pressing problems of the war.

At this time, no definite predictions can be made as to what the future developments will produce, but the requirements as outlined representing the user's needs will be helpful.

Opinion Not Realistic

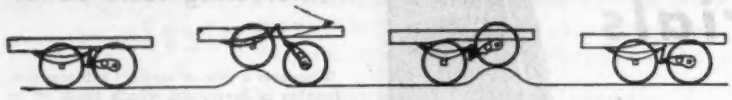
Without minimizing the importance of clear vision, it seems that many of the opinions on this subject are not on a practical and realistic basis. In too many instances, the studies are made with the vehicle considered as a stationary structure instead of a moving vehicle. The area where unobstructed vision is most important is certainly not close to the vehicle, but in that area which is sufficiently removed to permit maneuvering or stopping the vehicle to avoid a collision. No adequate studies of this have ever been made, or at least made public, but if they were, many of the criticisms which are made might be dismissed as relatively unimportant. It may be argued that there should be no interference with vision in any direction, but it is obvious that this cannot be attained in the rear area without extreme complication. This blind spot can contain an object, animate or otherwise, that the driver must take into consideration. However, the speed of the vehicle is low when operating in reverse and accidents from this direction are not frequent. The blind spots ahead of the vehicle, and particularly at the corners, are in the same category. When the driver sees that there is an object ahead which will come in these zones, he should reduce speed to guard against an accident, and should do this even if there were no blind spot.

This discussion is not an attempt to deprecate the importance of vision or to defend what has been done, but is merely an attempt to put the subject on a practical basis where it can receive intelligent consideration.

END

(Please resume your reading on P. 44)

NO PRIORITY
OR
CERTIFICATE OF TRANSFER
NEEDED TO GET ★
TRUXMORE
WORLD'S BEST 3RD AXLE

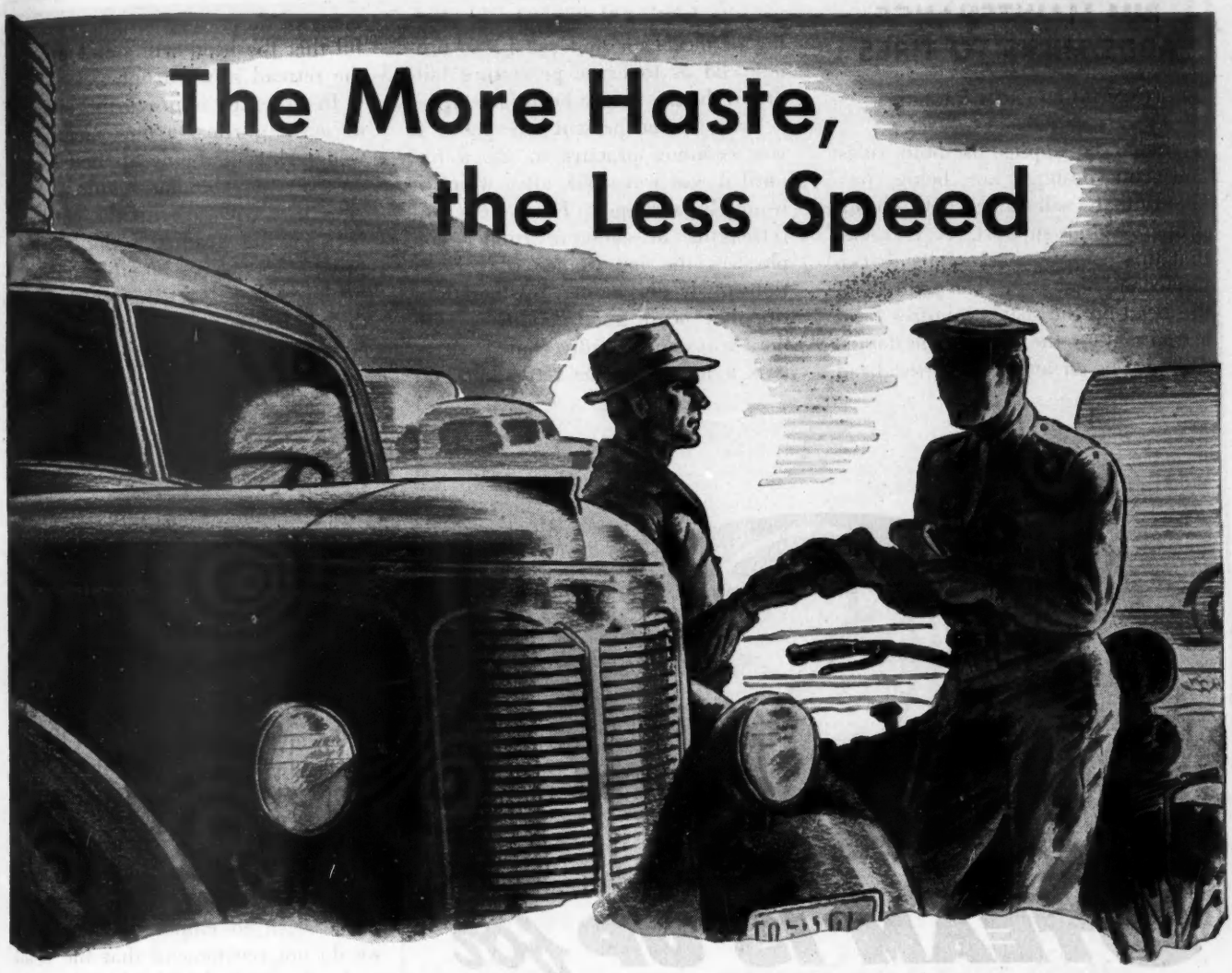


IT'S EASY NOW—TO
IMPROVE THE EFFICIENCY
AND INCREASE THE CAPACITY
OF YOUR NEW AND USED TRUCKS.
NATIONWIDE SALES AND SERVICE
THRU TRUCKSTELL DISTRIBUTORS.
★ SINCE JULY 1, 1944

WRITE FOR BULLETIN #34

"A TRUCK SHOULD BE
A MONEY MAKING
MACHINE"

1791 FILLMORE AVE.
TRUCK EQUIPMENT CO. INC.
BUFFALO, N.Y.



Fine lubricating oils, like safe driving records, cannot be made by hurry-up methods. In oils, as in driving, short cuts are bad for long runs.

The reason Wolf's Head HEAVY DUTY ranks first among fleet operators is because it is painstakingly produced to include *all five qualities* vital to heavy duty service. Starting with 100% Pennsylvania crude, no step is omitted, no measure stinted, to make it ideal for overload conditions.

Resistance to breakdown . . . tough film strength . . . high detergency . . . resistance to sludge and varnish formation . . . completely non-corrosive to metals . . . these are the five elements that place Wolf's Head HEAVY DUTY far out in front in its field. No other lubricating oil combines them to the same degree.

For FACTS on how HEAVY DUTY cuts costs, saves engine wear, write for our free booklet, "Heavy Duty Maintenance." Address Wolf's Head Oil Refining Co., Inc., Oil City, Pa., or New York 10, N. Y.

WOLF'S HEAD LABORATORY CONTROL SERVICE

A free service that gives fleet operators specific recommendations for their units, based on analysis of crankcase oil. Helps to establish correct drain periods, conserve engine life, reduce lay ups—frequently reveals unsuspected engine troubles.

WOLF'S HEAD

MOTOR OIL AND LUBES

100% Pennsylvania P.G.C.O.A. Permit No. 6

RIM MAINTENANCE ADDS MILES TO TIRES

(CONTINUED FROM PAGE 53)

it should be applied to both sides, and rim designs are being provided that will give both beads proper radial support. It is found that this condition accomplishes two important functions. The tight fit of the bead on the seat minimizes bead action against the face of the flange. This action on an unsupported bead permits friction that results in chafing of the beads and can be so pronounced as to cause premature failure of the tire due to bead failure.

Prior to the present emergency it was common practice to use a tire until it was worn out, after which it would be scrapped. The practice of retreading to conserve rubber emphasizes the importance of prevention of bead chafing. Although a tire may be in good condition, with the exception of badly chafed beads, it is a poor risk for retreading. In many of these cases it appears doubtful that the bead will stand up until the retread is worn out.

In order to improve the situation of existing rims, a new member—a wedge ring—is being applied for use on the removable flange side of truck rims that will take up the clearance between the bead and the rim and provide, as near as possible and practicable, a bead seat that conforms to that established in the designs of the advanced rim program. Large quantities of these have been used by tire companies and fleet operators with excellent results. Fig. 3 shows the wedge applied to four different types of rims in common use.

A large number of units in operation have rims which are so old that they are badly corroded and pitted. Some of these are so bad that they will cause premature failure of the tire at the bead. Operators should make it a point to have their rim equipment inspected, and replacements made of any material that is corroded to the point that the surfaces supporting the tire are in a roughened condition. When such replacement is made, the use of the bead wedge will make a further improvement.

We wish to emphasize here that we do not recommend that the bead wedge be applied with rims that are badly corroded since the optimum results will not obtain. Some operators have been careful to maintain their rim equipment by proper cleaning when tires are changed and repainting where corrosion has removed the coating provided in the new assembly for rust prevention.

Care must be exercised by operators to see that their maintenance men use the proper materials, if a coating is put on the rim. The use of oil or greasy lubricants is discouraged, as those substances have a bad effect on the life of rubber in the tire. The coating should be some form of paint which will not dissolve and surfaces should be thoroughly cleaned before this coating is applied.

The chemicals used in tire compounding have the effect of accelerating corrosion, particularly when the tire and rim are exposed to water or heat. Special care should be exercised in regions where salt is used in the winter as we note a very rapid deterioration of rim surfaces under

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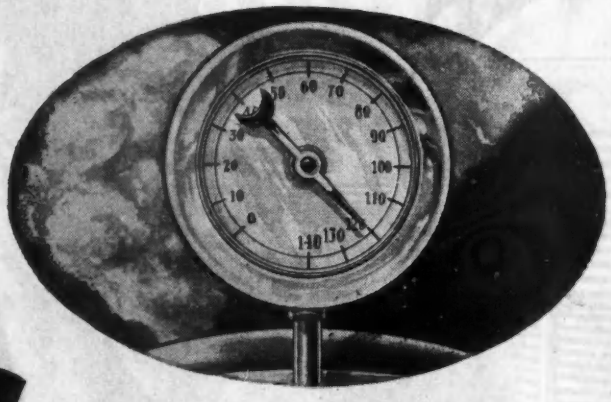

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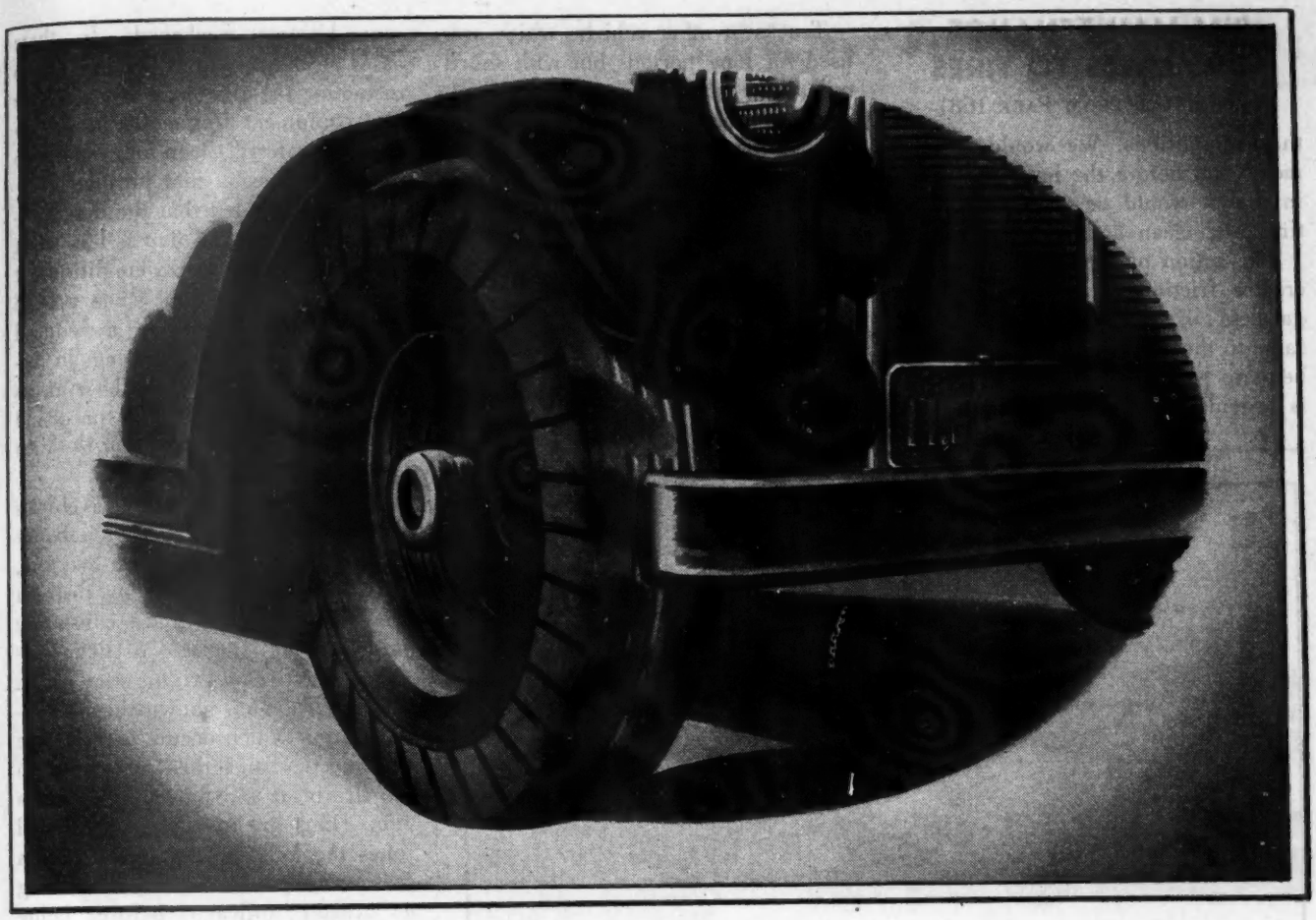
. . . that approaching day when we can produce LISLE TOOLS in the quantities you need

Today, due to war production, we are limited on the quantities of Lisle Tools we can produce. However, new regulations have brightened the production outlook considerably, and we expect to soon be able to make prompt shipments on Lisle Ridge Reamers and Cylinder Hones. Orders received now will have prior attention when full-scale production gets under way. We suggest you send them today. LISLE CORPORATION, Box 1017, Clarinda, Iowa.

Lisle QUALITY TOOLS

LISLE RIDGE REAMERS
LISLE CYLINDER HONES



Remember when . . .

—nobody worried too much about "cupped" tires?

"Cupping" has *always* meant rubber waste. (Even misalignment as little as ½ inch grinds as much rubber off truck tires as dragging them sideways 87 feet in every mile.)

Before the war—that kind of waste didn't threaten the nation's transportation system. Today it *does.* Today it's not only good business but good citizenship to

CHECK ALIGNMENT
EVERY 1000 MILES—and *keep rolling*
at VICTORY SPEED!

INSIDE FACTS ABOUT RUBBER

Truck tires for civilian use are *scarcer than ever.* Continuing high military needs have taken practically all of the rubber industry's expanding truck tire production. Even many essential trucks are going out of service for lack of tires. *Make your tires last by giving them the extra care they must have.* If you do get *new* truck tires, remember that synthetic rubber is a *new* material that will not withstand high speeds, excessive loads and improper inflation as well as natural rubber. Check loads and inflation *daily.*

SEIBERLING

Heat-Vented TRUCK TIRES

Built by *Experts in Rubber*

RIM MAINTENANCE ADDS MILES TO TIRES

(CONTINUED FROM PAGE 168)

those conditions. We would recommend that before the icy season sets in that it would be wise to remove tires and clean and paint the rims.

The action of the tire on the rim creates friction to some degree regardless of the method of fitting same to the rim. This condition also helps to wear down any coating that is provided for rust-proofing.

Trucks or other vehicles which are used for long periods but with short mileage should have special attention. There are many cases where the same tire equipment may be on a rim for several years but, due to circumstances of the service and storage conditions, corrosion may be very rapid between the tire and the rim and in some cases the degree of loss of section of the interlocking members can be enough to make the rim unsafe for structural reasons or because the mechanical locking parts may become weakened. In these cases it is wise for the operator to dismount the tires and examine the rim equipment frequently in the interest of safety. Clean and repaint to prevent corrosion and pitting.

It will be noted that the deterioration of the tire and flap is less when the rims are in a clean condition. It also will be noted that when a bead wedge is used there is a reduced amount of moisture getting in between the tire bead and the rim, as the wedge has filled that space and established a seal because of the firm seating of the bead.

Tires and rims used on vehicles such as buses or chain store delivery units that are frequently washed and, particularly those that go through the washing tunnels, are constantly saturated and the rate of deterioration of the tire and rim is very rapid.

Experience has shown that the deterioration which occurs between the tire and the rim is just as harmful to the tire bead and flap as it is to the rim. Rims are now running several times the mileage that they would a few years ago. Vehicles are running a greater mileage before being scrapped because of better preventive maintenance to the mechanical units. It goes without saying that the mechanical units receive a reasonable amount of attention in the way of preventive maintenance. We wish to emphasize that under present circumstances rim equipment should be put in the same category and all operators should have a schedule for inspecting and reconditioning their rim equipment, if they wish to maintain their vehicles on a basis of safe operation and favor the tires in every way possible.

END

(Please resume your reading on P. 54)

STOP WHEEL SPIN ON SNOW PLOWS

Get Positive Traction with

Start now to fix your snow plow trucks so the wheels will pull (not spin) in deep snow or on slippery, icy roads.

Install the Thornton *Automatic-Locking* Differential in place of the conventional type. This eliminates one wheel going dead and other wheel spinning. Both wheels must rotate when power is applied. Motor cannot drive either wheel faster than ring gear speed. Prevents wheel spin . . . tire grinding . . . skidding due to loss of tire grip on ground.

Worth looking into *right now.* Send coupon for full facts and catalog.

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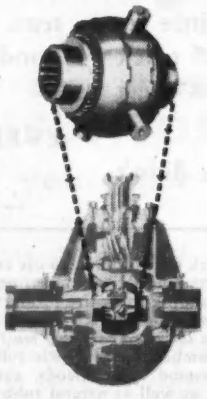
Automatic Locking
DIFFERENTIALS



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For replacement, and for original equipment, GUNITE Brake Drums have a lot to offer. They are made of a self-lubricated metal, with graphitic structure evenly distributed, which maintains a uniform coefficient of friction around the whole drum. They are designed for high heat conduction that means long life, and high rigidity that means elimination of flex on cam and anchor sides. They do away with troubles caused by distortion, warpage, score, and heat check. They have proved superior in all types of service on cost per mile, lining life, brake efficiency, and interval between adjustments. These advantages are obtained through careful and experienced engineering to meet the demands of the required service, backed by quality manufacture with full metallurgical control. Use GUNITE for lasting satisfaction!

WRITE FOR THIS CATALOG

Over 850,000 Gunite Brake Drums have been made since 1928

GUNITE FOUNDRIES CORPORATION
ROCKFORD, ILLINOIS

CHEMISTRY AIDS FLEET'S MAINTENANCE

(CONTINUED FROM PAGE 61)

any continuous trend toward trouble can be quickly detected. Foreign metal revealed by the analysis as present in the lubricant offers important clues as to what may be going wrong. If, for example, this metal is identified as coming from a bearing or a ring, the maintenance man is advised and adjustments are made before the trouble becomes deep seated. Thus, in this tipoff of possible future failures chemistry has definitely scored, in the fullest sense, as an ally of the Willett preventive maintenance program.

Time and again, Mr. Gershbein also stated, analysis of the oil samples has demonstrated that, in certain cases of mechanical failure, the fault has not been due to defects in the assembly but to the bad effects of a poor lubricant upon the assembly.

The laboratory has played an important part in "post mortems" involving such serious and costly matters as rear failures, Mr. Gershbein said. In one such case samples of all lubricants were taken from the damaged vehicle at the time of the damage, and sent into the laboratory along with the parts involved and samples of the unused grease. Check-up of maintenance records established that the truck had been greased not far prior to the time of the accident, and that there was no question of negligence in attending to this job.

After standard tests of the lubricant had been made in the laboratory, the conclusion was reached that, because of the chemical nature of the grease, it had quickly broken down under operating conditions, leading directly to the mechanical failure of the equipment. These findings of the Willett laboratory, Mr. Gershbein said, were corroborated by the oil company.

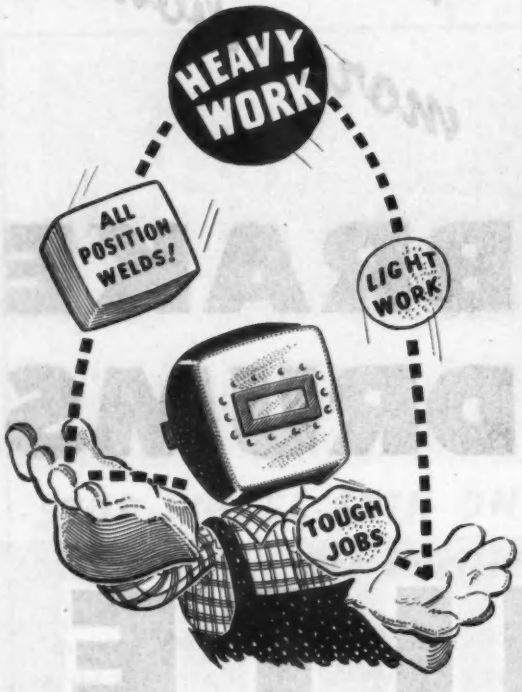
"Naturally," he continued, "neither an oil company nor the maker of the parts involved is ever willing to admit that the fault in such situations is his, and each of them will turn a deaf ear to the experts on the opposite side. But the Willett Company, through the new tools at its command, could provide its own independent check on all factors and establish the blame beyond question."

It required some time, he said, to make the maintenance men "chemistry conscious." Old timers were contemptuous at first of the "new fangled" ideas represented by the laboratory and insisted on their rule of thumb procedures. When high fuel dilution or other clues indicate that the oil situation is bad and serious results are imminent the men are instructed to drain and flush on the basis of their own judgment.

But they are also instructed to take samples and send them along just the same and this has served as a check on too liberal interpretation of their right to freedom of action in the old ways. Gradually, the greasers have been trained to realize that chemistry can aid maintenance and are beginning to volunteer suggestions on what "maybe" ought to be looked into by the chemist.

It takes diplomacy to keep from

(TURN TO PAGE 174, PLEASE)



it's Easy WITH A MARQUETTE

Run of the mill repair jobs are "duck soup" for Marquette Welders, but it's the extra tough ones that bring out the remarkable performance characteristics of these versatile machines, and really prove the outstanding time and money savings possibilities of electric welding for automotive maintenance and repair.

Cracked engine blocks and cylinder heads, damaged chassis and body members are only a few of the items that can be made as good as new at a fraction of the cost and time needed for dismantling and replacement.

Backed by years of leadership in the a.c. field and brilliantly utilizing the inherent advantages of a.c. current, Marquette Welders are low in original cost and low in operating cost . . . producing flawless welds on sheet metal or the heaviest castings without the slightest trace of "magnetic blow" and with the speed and economy that is the delight of the most critical operators.

AUTOMATIC VOLTAGE CONTROL — INSTANTANEOUS HEAT SELECTION — ALL ASBESTOS INSULATION — NEGLIGIBLE UPKEEP — COMPLETELY EQUIPPED — 10 MODELS, 125 to 400 amps.

Send for free, 24 page, illustrated booklet.

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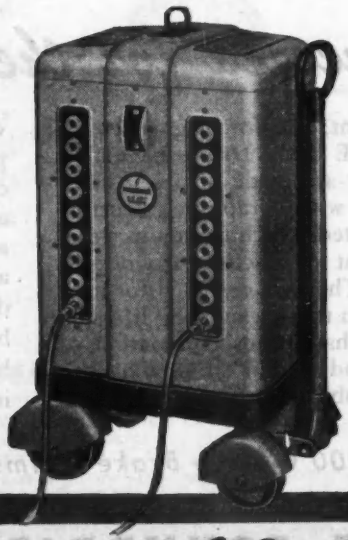

MARQUETTE
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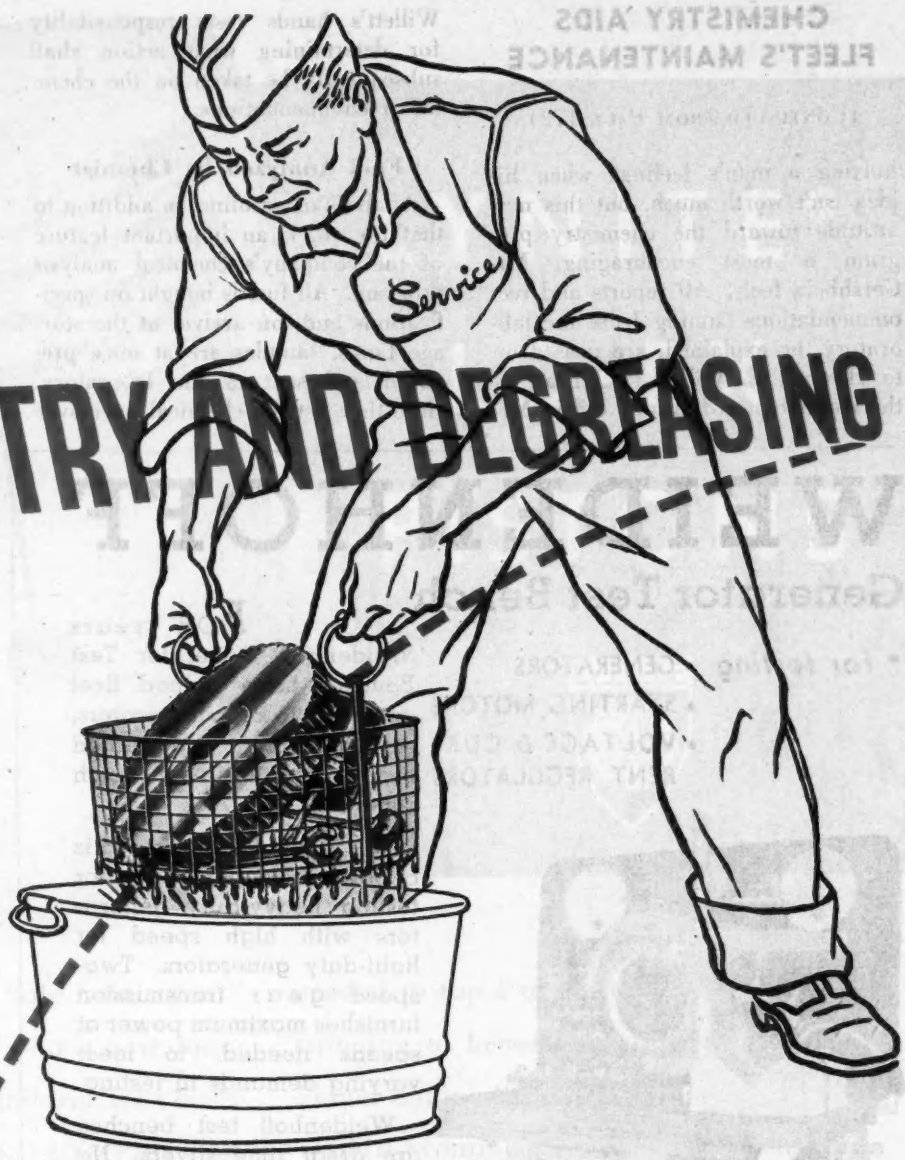
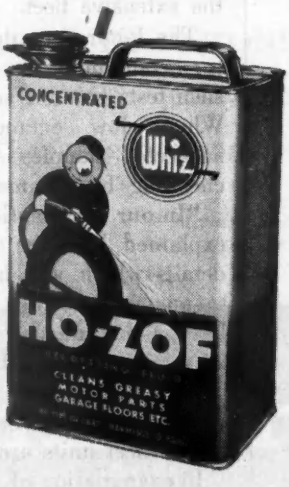
a.c. arc welders

CHEMISTRY AND DEGREASING





HO-ZOF **is the modern way — *the chemical way* —to remove accumulations of grease, oil, and grime from engine parts and tools! It's quick, thorough, safe!**

HO-ZOF is a concentrated chemical compound developed in the famous Hollingshead laboratories. Mixed with kerosene—or a suitable substitute—it converts grease into a form of liquid soap that is easily flushed away with water. HO-ZOF is ideal for degreasing motors, machinery, parts, tools, work pits, floors, driveways. No noxious, explosive fumes. Leaves no slippery film. *R. M. Hollingshead Corporation, Camden, New Jersey; Toronto, Canada.*

Hollingshead

Whiz

BUY MORE BONDS

LEADER IN MAINTENANCE PRODUCTS

CHEMISTRY AIDS FLEET'S MAINTENANCE

(CONTINUED FROM PAGE 172)

hurting a man's feelings when his idea isn't worth much, but this new attitude toward the chemistry program is most encouraging, Mr. Gershbein feels. All reports and recommendations coming from the laboratory, he explained, are passed on to Howard L. Willett, Jr., head of the maintenance division, and in Mr. Willett's hands rests responsibility for determining what action shall subsequently be taken on the chemist's recommendations.

Fuel Analyzed by Chemist

Analysis of gasoline, in addition to that for oil, is an important feature of the company's chemical analysis program. All fuel is bought on specifications and, on arrival at the storage tanks, samples are at once prepared and sent to the laboratory. Here they get the chemical once-over for comparison with the specifications and, if the new supply fails to measure up to the standard, the supplier is immediately notified.

To find a shipment of gasoline off grade is not a rare occurrence, Mr. Gershbein asserted. Refiners do not knowingly seek to deceive, but in mass production under current war conditions, slip-ups can occur. These the laboratory can readily detect, and he has found the company at fault always eager to make satisfactory adjustments.

"Sometimes," he remarked, "one is really thankful that he gets what he does, even though it is not up to standard. Otherwise, he might have to get along without much of anything."

He told of one gasoline shipment received some two years ago which, on analysis, showed an extremely high vapor pressure. Had this volatile, "wild" gas been introduced into the fleet tanks to any extent, widespread damage from "vapor locks" would undoubtedly have resulted. Fortunately, the shipment had arrived at the week end and the immediate analysis had revealed the undesirable condition before use of the new gas supply began.

Prompt analysis of newly delivered gasoline also has at times, revealed excessive amounts of gum, which would have led to engine trouble and damage. Location of the laboratory right at the terminal, he pointed out, has proven extremely advantageous in such cases by making analyses possible soon after arrival of the new materials and before consumption of any faulty material gets under way in the extensive fleet.

The laboratory does not run tests for octane numbers, as equipment for such tests has not yet been acquired. Where low octane numbers are suspected samples are sent out for checking by commercial laboratory.

"In our examinations," the chemist explained, "We are interested only in details which will be of importance to our maintenance department. We have a definite use for all our findings. Any phase of the analysis which cannot be expected to serve in the later correction of mechanical defects in our fleet units are disregarded."

In examination of oil, he continued, tests are run, among others, for fuel dilution, percentage of solids in

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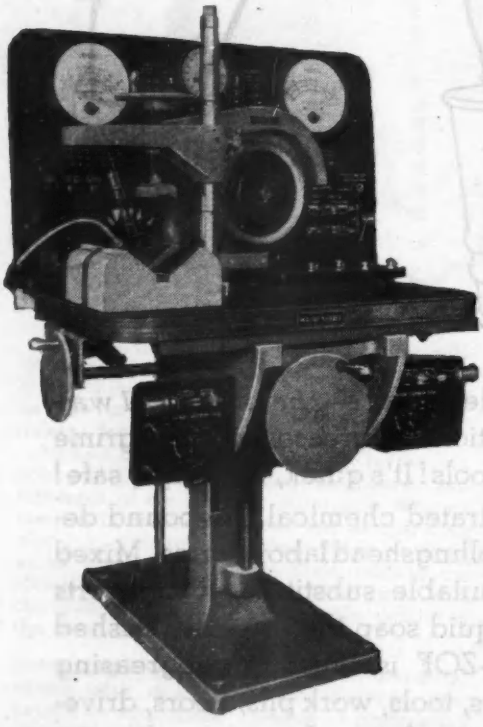
WEIDENHOFF

Generator Test Bench

• *for testing* • GENERATORS
• STARTING MOTORS
• VOLTAGE & CURRENT REGULATORS



FOR years Weidenhoff Generator Test Benches have helped fleet operators to keep generators, starting motors and related electrical units in top notch condition.

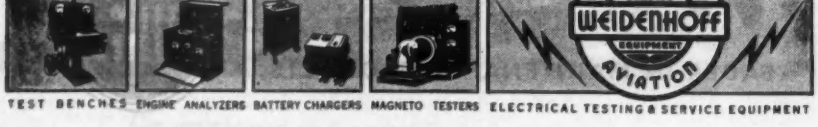
The Model 501 illustrated is a powerful super bench for testing heavy-duty generators with high speed for light-duty generators. Two-speed gear transmission furnishes maximum power at speeds needed, to meet varying demands in testing.

Weidenhoff test benches are great time savers. No complicated hook-ups. Push button type switches in conjunction with the pilot lights instantly select and indicate ammeter and voltmeter scales. Only 3 connections are necessary with externally controlled generators. All other connections are incorporated within the bench. Generators tested both directly coupled to output shaft of transmission or by belt drive. All controls, switches, etc., plainly marked for quick, easy operation.

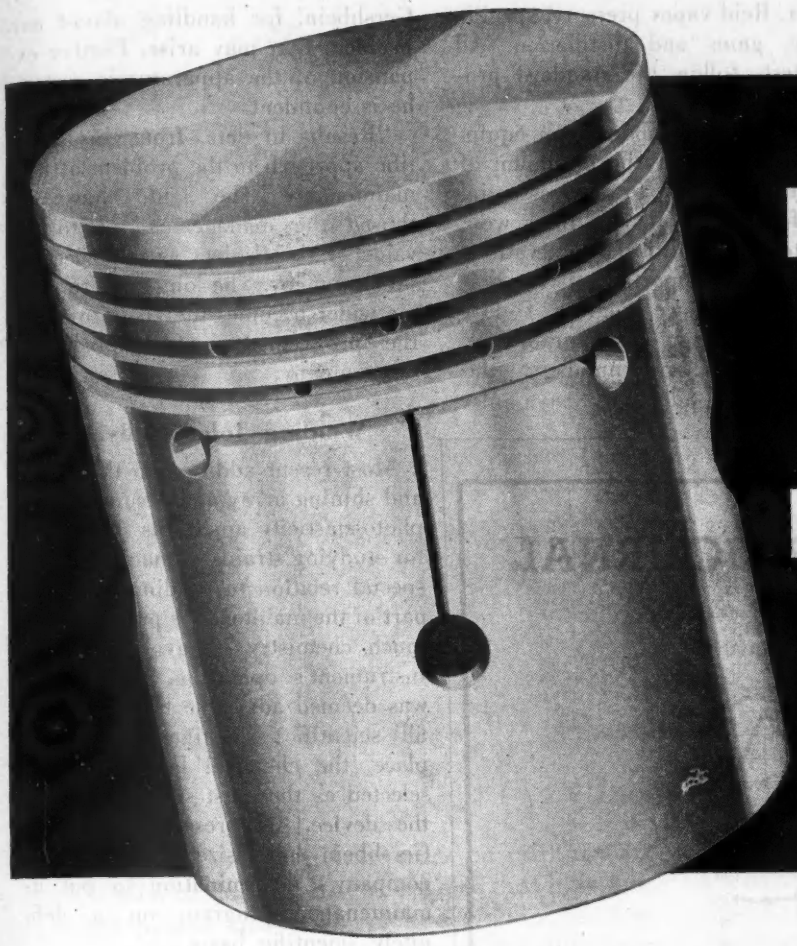
More and more fleet operaters are finding the right answer to present-day problems by using Weidenhoff equipment. It conserves available manpower and helps to keep electrical units in best possible condition. You, too, will benefit by sending for the full facts on the Model 501 Test Bench, and what it will do for your service.

BUY WAR BONDS

Joseph Weidenhoff, Inc. Chicago 24, Illinois U.S.A.



TEST BENCHES ENGINE ANALYZERS BATTERY CHARGERS MAGNETO TESTERS ELECTRICAL TESTING & SERVICE EQUIPMENT



LYNITE* LO-EX PISTONS

REG. U. S. PAT. OFF. A. C. O. A.

LYNITE A C ALUMINUM O A

Every day must seem like "old home week" to the ex-auto serviceman who is now doing that work in Uncle Sam's uniform. He's meeting up with LYNITE LO-EX PISTONS continually, because these pistons are as popular with builders of fighting equipment as they were with peacetime engine builders.

LYNITE LO-EX PISTONS are turning in the same high-quality performance as always. They are giving engines the "oomph" needed to top a tough fight. They are contributing to better operating economy and longer engine life.

OHIO continues to work at capacity, producing pistons exclusively for our fighters. Civilian needs have suffered. But it's our hope that LYNITE LO-EX PISTONS, machined and sold by OHIO, will soon be available on our dealers' shelves, ready to resume their place as leaders in the replacement market.

**Lynite and LO-EX are registered trade marks of Aluminum Company of America, makers of castings for genuine Lynite Pistons.*

THE OHIO PISTON CO.

CLEVELAND, OHIO

CHEMISTRY AIDS FLEET'S MAINTENANCE

(CONTINUED FROM PAGE 174)

water, Saybolt viscosity (from which S. A. E. numbers are determined), carbon residue and metal. In addition, where diesel units are involved, other tests are run when necessary to establish the effect of the oil on efficient operations.

In gas analysis, among tests made are included those for water, acidity, sulphur, Reid vapor pressure, specific gravity, gums and distillation. All these tests follow the standard procedures.

Originally, the laboratory's equipment included only the minimum of apparatus necessary to make essential tests of gas and oil. Additions were made to the facilities as operations indicated their importance to the preventive maintenance program. Today, with the exception of apparatus for determining octane numbers, the laboratory is adequate, says Mr. Gershbein, for handling almost any problem that may arise. Further expansion of the apparatus is certain, he is confident.

"Results to date, from this scientific approach to the problem of fleet maintenance," he said, "have enthused the management as to the value of the project as a device for saving money. The longer we're at it, the wider becomes the vision of what the program can accomplish for the company."

Welding Jobs Analyzed

Most recent addition to the bright and shining array of instruments is a photo-elasticity apparatus to be used for studying strains in materials, with special relation to welding jobs as a part of the maintenance program. Not much chemistry is involved in this instrument's operation, but since it was deemed advisable to concentrate all scientific investigations in one place, the chemical laboratory was selected as the most suitable site for the device. Its presence here, Mr. Gershbein emphasized, indicates the company's determination to put its maintenance program on a definitely scientific basis.

In the program of service to the purchasing department the laboratory functions not only to check quality and adherence to specifications but to examine new products and assay their possible value for increasing operating efficiency with economy.

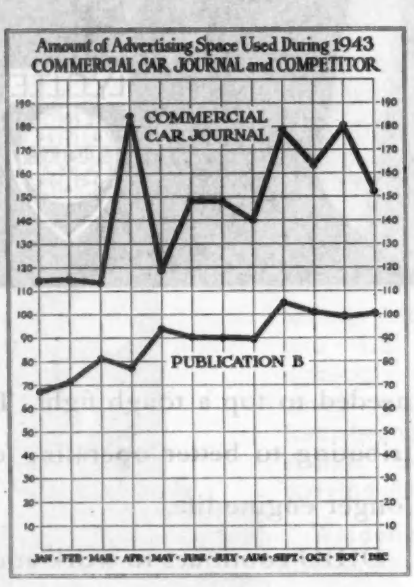
Everything of a chemical nature which enters into motor truck transportation is tested both in the laboratory and under operating conditions. Constant attention is given such products as diesel fuels, brake fluids, detergents and solvents for cleaning machine parts and truck bodies, and other items.

Too often, Mr. Gershbein remarked, buyers in motor truck organizations take the salesman's word for it and introduce a new product without the full knowledge of its nature which only unbiased chemical analysis can provide.

"No salesman's say-so is ever accepted at its face value here," he said. "Regardless of how prominent the manufacturer may be, every product is analyzed and the laboratory's decisions turned over to the purchasing agent. In a surprising number of

(TURN TO PAGE 178; PLEASE)

COMMERCIAL CAR JOURNAL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Is the Magazine for FLEET OPERATORS

COMMERCIAL CAR JOURNAL has the largest circulation in its field.

25,000 copies go into the shops of fleets with eight or more *trucks*, throughout the United States. This is the largest truck fleet circulation provided by any publication.

Other copies go to the truck trade. This is *plus* circulation, nowhere else available.

COMMERCIAL CAR JOURNAL carried 1376.5 pages of paid advertising in 1942 — almost twice as much as the next nearest fleet publication.

Editorially, COMMERCIAL CAR JOURNAL has been the leader since it was founded, in 1911. It is by far the oldest and best established publication in its field.

COMMERCIAL CAR JOURNAL

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For Little Nuts in Tight Places

Here's how to speed up your work on carburetors, distributors, radios and anywhere else that little nuts in tight places are often such a headache. Use Bonney Miniature Wrenches and see the difference they make—the time they save you!

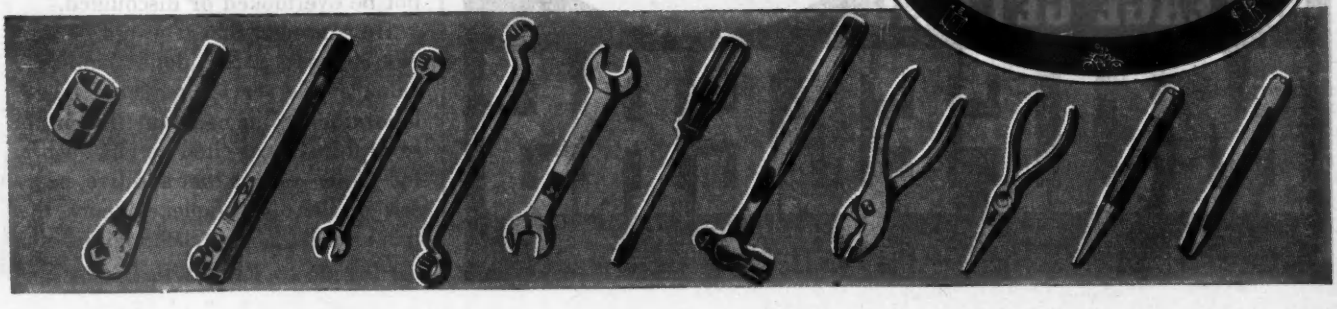
Bonney Miniature Wrenches are small but tough, with accurately machined jaws that fit the nut *just right.* There's no binding, no slipping with Bonney Miniatures. To help you get into close quarters easily, they have specially-designed pear-shaped heads that take up minimum space, yet actually give you greater turning room. And to provide sure leverage and longer wrench life, the points of greatest strain are reinforced with extra metal and carefully balanced with the rest of the tool.

Bonney Miniature Wrenches are made of the same high quality tool steels, to the same exacting specifications, as all of the tools in the famous Bonney line. We spare no cost to assure a top quality product for you . . .

Bonney Tools are sold exclusively through jobbers from coast to coast.

Wrench No.	Openings Milled	Length	Thickness Heads
H10	3/16 & 7/32	2 1/2"	3/32"
H12	1/4 & 9/32	3"	5/32"
H14	5/16 & 11/32	3 3/4"	3/16"
H16	3/8 & 7/16	4 1/8"	7/32"
H18	13/32 & 15/32	4 1/8"	7/32"

BONNEY FORGE & TOOL WORKS · 635 N. MEADOW ST. · ALLENTOWN, PA.



CHEMISTRY AIDS FLEET'S MAINTENANCE

(CONTINUED FROM PAGE 176)

cases, the wisdom of this procedure has been amply justified."

There was, for example, the case of the salesman who came in full of pep and pride in his product, an additive for gasoline, guaranteed to reduce consumption and increase milage. Backing his claims, the man had a portfolio of testimonials, which indicated that the product was being extensively utilized in one certain section of the country.

"His sales talk was convincing," related Mr. Gershbein. "We listened closely, then went to work on the stuff, giving it a series of laboratory checks and road tests. The latter demonstrated that the additive, if used would, if anything, actually increase gas consumption.

"Then our chemical analysis revealed further that the compound was highly acidic in nature and, if used in our vehicles, it definitely would have brought about deterioration of the parts. Such damage, if it had gotten under way in a large fleet like ours, would have been disastrous and would have decidedly outweighed the asserted advantage of reduced consumption, if there had been any basis for that claim. We turned thumbs down on this additive and nothing has ever moved us to retract this decision."

The system for examination of all purchases or proposed purchases works in a positive direction as well as serving to head off injurious or inefficient products. Once the valid merits of an item have been established by the chemical examination and the operating tests, the manufacturer can be certain of the Willett company's continued patronage.

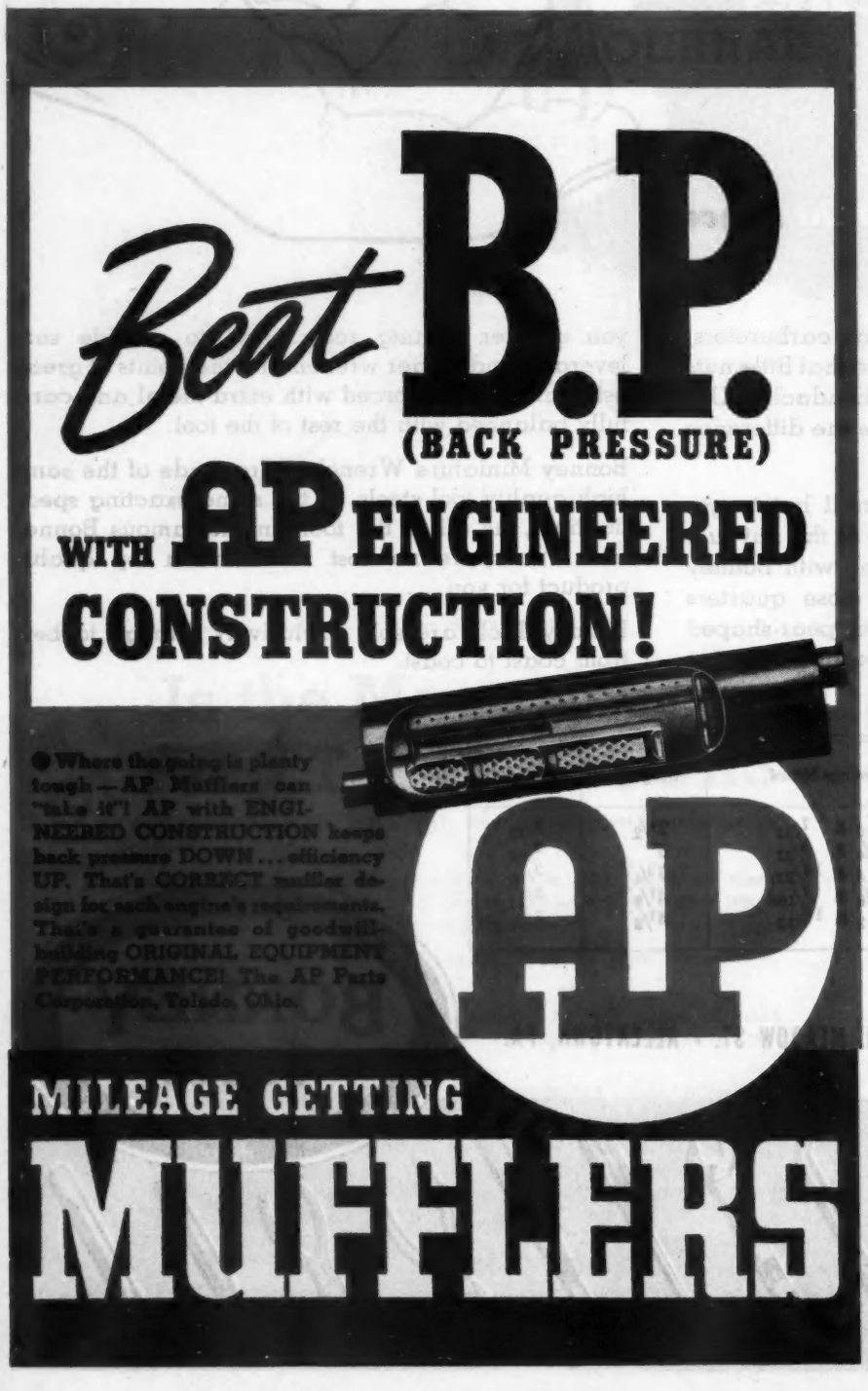
But this, Mr. Gershbein cautioned, does not imply that the company commits itself indefinitely to use of any particular product. New developments in the manufacturing world are constantly under scrutiny and, if a new product offers promise of doing a better job at less cost, there is no hesitation about adopting it, once its worth has been scientifically demonstrated in the company's independent tests.

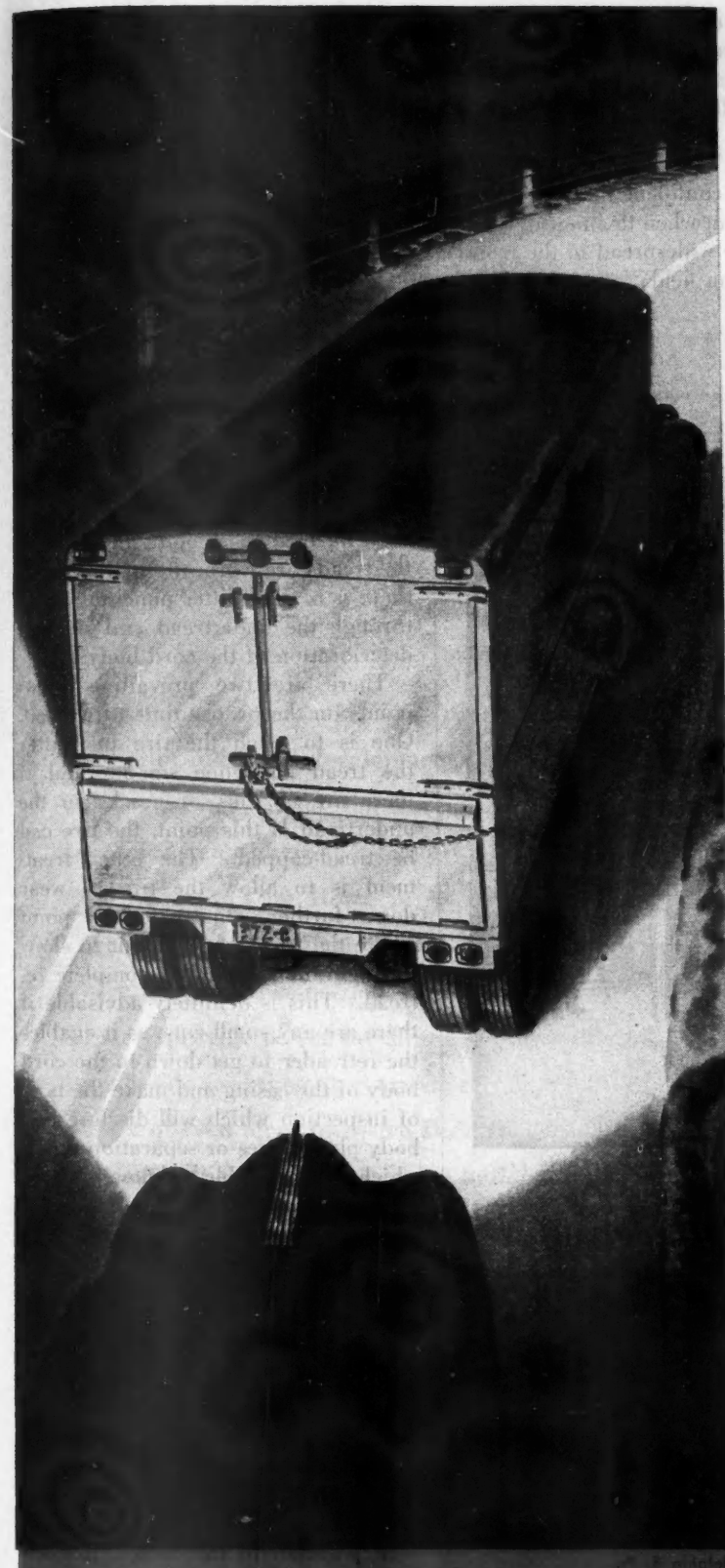
The routine analysis of oil and gas, Mr. Gershbein admitted, could be done by a commercial testing laboratory. Many oil companies, he also recalled, assist their customers by analyzing oil from crankcases. Such service, however, he contends, can lack the personalized, "hand tailored" touch a laboratory, such as that of the Willett Company on its own premises, can provide.

"Our laboratory is close to the operating end of the business," he said. "We are familiar with each unit, its weaknesses or virtues. We know the wear and tear each unit faces and can make more definite recommendations for correction of faults and can make them promptly. Such advantages of a laboratory at the terminal should not be overlooked or discounted."

He conceded that it would be difficult to assay the dollars-and-cents value of the service rendered by the laboratory to the company. But in the several instances cited herein, such as the "wild" gas, or that additive, he asserted, there is ample evidence that this unusual motor truck maintenance

(TURN TO PAGE 180, PLEASE)


Beat B.P.
(BACK PRESSURE)
WITH AP ENGINEERED CONSTRUCTION!
Where the going is plenty tough — AP Mufflers can "take it"! AP with ENGINEERED CONSTRUCTION keeps back pressure DOWN... efficiency UP. That's CORRECT muffler design for each engine's requirements. That's a guarantee of goodwill-building ORIGINAL EQUIPMENT PERFORMANCE! The AP Parts Corporation, Toledo, Ohio.
AP
MILEAGE GETTING
MUFFLERS

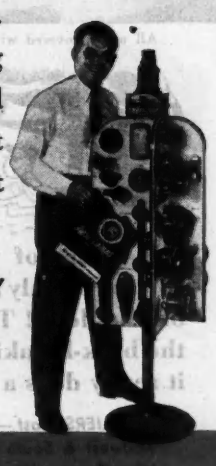


BETWEEN THE BRAKE PEDAL AND THE FLOORBOARD..

● There's a short distance—and very little time—between the brake pedal and the floorboard. And, because of inadequate safety lighting, thousands of accidents can be traced to this spot.

For more than a quarter century, K-D has led the field in safety lighting equipment. The reason is *quality*. All K-D Lamps are manufactured to exceed the most rigid requirements. Precise highway engineering assures maximum visibility, low maintenance costs, and minimum breakage. Special and exclusive safety features are inherent in every K-D Lamp.

Your K-D Jobber knows lights and lighting requirements. Whatever your lighting problem, he will be glad to recommend the right light for the right job at the right price.



THE K-D LAMP COMPANY
CINCINNATI, OHIO

K-D LIGHTING

The Right Light for the Right Job

(CONTINUED FROM PAGE 178)
tool is fully paying its way. By serving as a means to prevent increase of operating costs, he said, the laboratory is "adding to stockholders' returns."

"It's true," he remarked, "that you do not hear much about chemistry around most motor truck terminals. In the operation of our laboratory we have demonstrated that the chemical angle of maintenance is extremely valuable and important. Through these chemical tests and the interpretation of our findings in correlation with the customary mechanical checkups, significant economies in operations have been brought about.

"Eventually other motor carriers are going to make a similar discovery of chemistry's possibilities for serving them. I am confident that the day is not far distant when this new development will be widespread in the motor transportation field."

END

(Please resume your reading on P. 64)

Badly oil-soaked hoist-floor

SOL-SPEEDI-DRI starts to work

All oil is covered with SOL-SPEEDI-DRI

SOL-SPEEDI-DRI *has been swept up!*

"BREAKFAST IS SERVED"

APPLY SOL-SPEEDI-DRI to the greasy, oily floors of your garage and it will absorb the deposits so thoroughly that you'd be happy to eat your breakfast off the floor! There's nothing like SOL-SPEEDI-DRI for saving the back-breaking labor of scouring oil-soaked floors . . . and it really does a job! Write today for details.

SUPPLIERS: East — Refiners Lubricating Co., New York 1, New York.
Midwest & South — Waverly Petroleum Products Co., Philadelphia 6, Pa.
West Coast — Waverly Petroleum Products Co., Russ Bldg., San Francisco 4, Calif.

Free SOL·SPEEDI·DRI OIL AND GREASE ABSORBENT *Sample*

CODDLE SYNTHETICS WITH GENUINE TIRE PM

(CONTINUED FROM PAGE 51)

steps to avoid further loss by changing the operating conditions.

Retread at the Proper Time

One of the most important of the tire man's duties would be to watch the tires to see that they are removed for retreading at the proper time before they are worn too far and, at the same time, all through these frequent inspections watch for tread cuts and tread cracks which should be taken care of immediately. After they have gone smooth, the further the treads are worn, the more danger there is of road litter punching holes through the undertread and starting deterioration of the cord body.

There are two prevailing viewpoints on the proper time to retread. One is to catch the tire just after the tread has gone smooth and if there are no cuts or cracks in the undertread at this point, the tire can be tread-capped. The other treatment is to allow the tire to wear down further, almost to the point where the tread ply is about to show through and then add a complete retread. This is definitely advisable if there are any small cuts, as it enables the retreader to get down to the cord body of the casing and make the type of inspection which will disclose any body ply injuries or separation about which it is desirable to know. There are arguments on both sides in favor of both types of procedure. The road operating conditions will probably determine which is more economical for your particular operation.

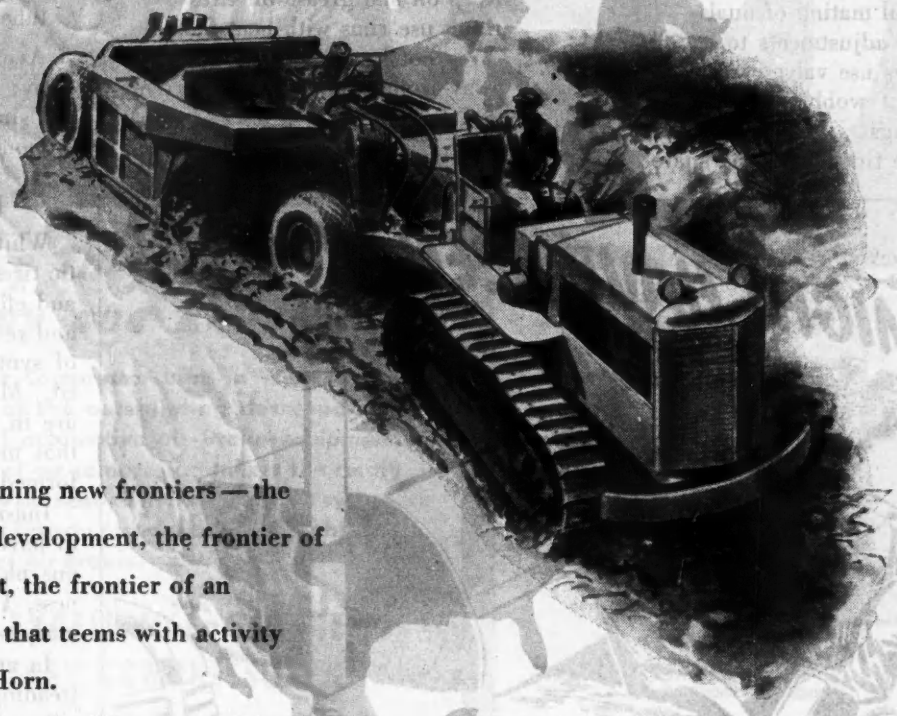
It goes without saying that when a tire is up for retreading a very thorough inspection should be made for ply or tread separation as well as for cord body weaknesses which might interfere with further worthwhile service of the casing.

In addition to the above, it goes without comment that all the commonplace preventive maintenance procedures should be observed, such as:

1. Eliminate abuse by:
   Starting easy
   No violent application of brakes
   Avoid hitting curbs, road obstacles, etc.

(TURN TO PAGE 182, PLEASE)

FROM ALASKA TO CAPE HORN



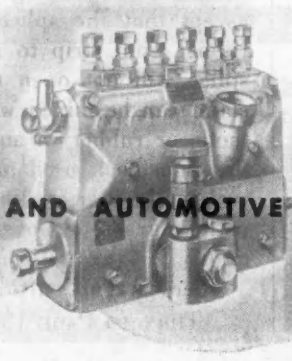
Diesel engines are opening new frontiers — the frontier of industrial development, the frontier of growing military might, the frontier of an awakened hemisphere that teems with activity from Alaska to Cape Horn.

Their contribution? More flexible, more economical power where, when, and as needed. Diesels help build airports, provide power for mines, get out rubber in Brazil — do useful work everywhere.

An era of even more intensive Diesel use lies ahead — an era in which the Diesel engine builders of America will render world-wide service to transportation, industry, and commerce.

As a supplier of fuel injection equipment to engine manufacturers, American Bosch continues to provide competent maintenance service, the widest variety of equipment, and experienced counsel in application engineering.

AMERICAN BOSCH CORPORATION • SPRINGFIELD, MASSACHUSETTS



AMERICAN BOSCH

AVIATION AND AUTOMOTIVE ELECTRICAL PRODUCTS • FUEL INJECTION EQUIPMENT

CODDLE SYNTHETICS WITH GENUINE TIRE PM

(CONTINUED FROM PAGE 180)

Taking curves slowly
Avoiding rim bruises

2. Add mileage by:
Careful mating of duals
Brake adjustments to equalize
Always use valve caps
Correct wobbly wheels and worn bearings
Rotate tires, including spare
Keep front wheels in proper alignment by periodic checks
Tire and wheel balance helps
Replace sagging trailer axles

3. Preserve tire body by:
Repairing cuts
Recapping when worn smooth
Keep oil and grease off tires
Don't use rims with bent flanges
Tires not in use should be stored away from light, heat, air currents and dampness

4. Make tubes last longer:
Use care not to pinch in mounting on drop-center rims
See that truck flaps are used and in good condition
Clean dirt out of casing before putting tube back
Use lubricant with synthetic tubes —soapstone or soap on base of tubes and tire beads

5. Avoid unnecessary tire changes by:
Using most approved procedure in mounting and dismounting tires

Reconditioning Tires

While the development of synthetic tires has been going on, practical and effective procedure for repairing and retreading various classifications of synthetic tires have been perfected. Manuals have been written and are in the hands of repair shops so that most of them are properly informed on how to handle this work.

Inasmuch as it is quite common to have questions put to us on various phases of this part of the business, I will give a condensed summary of the essential factors.

In any of the various forms of retreading, recapping, and top capping either rubber camelback, synthetic camelback or reclaim camelback can be used successfully on either a rubber body or a synthetic body. Any of these combinations is effectively handled by the use of a layer of approximately 1/16 inch gage cushion gum of rubber necessary as a tie-strip for proper adhesion.

By way of comparison, a synthetic versus a rubber-reconditioned tread should give substantially the same ultimate tread wear mileage, but the synthetic is more susceptible to cuts and snags. There should be no difference in the possibility of a synthetic retread separating from the cord body compared with a rubber retread.

There are no special precautions needed in retreading with synthetic except that the splice has to be a rubber gum strip to make sure the splice will not open up. Since reclaim can be mixed with either synthetic or rubber in any proportions, the camelback used may have some reclaim in it according to the competitive grade or Government regulations.

There are no particular complica-

(TURN TO PAGE 184, PLEASE)

Teleoptic Signals Give the Utmost in Signal Protection

Shippers appreciate knowing that their merchandise is protected by *Teleoptic* Directional Signals. They want safe — on-schedule delivery — not damage claims.

The patented "angular" construction of Teleoptic Signals insures visibility from all angles for over 125 feet — *Day or Night.* Extra heavy ground glass lenses. Rustproof—Dustproof—Shakeproof. Finger tip switch control. Scientifically correct, Teleoptic Signals are approved by ALL STATES requiring directional lights.

A limited number of sets available without priorities for trucks not previously equipped.

3 Types of Switch Controls

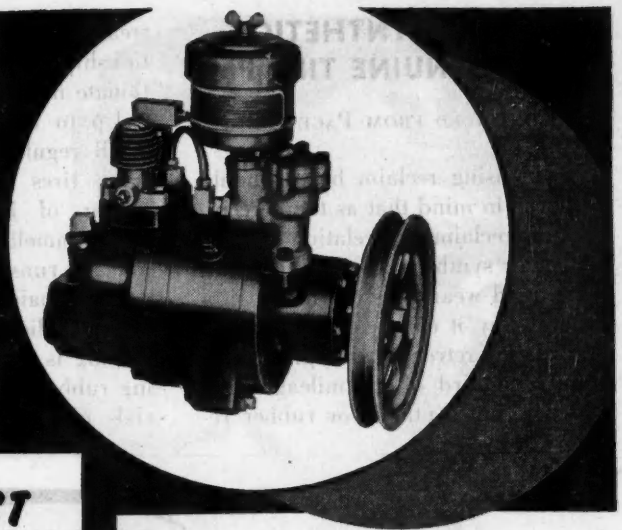
The TELEOPTIC Company
712 Marquette St. Racine, Wisconsin

ONLY

WAGNER *Air Brakes*

have the

ROTARY COMPRESSOR



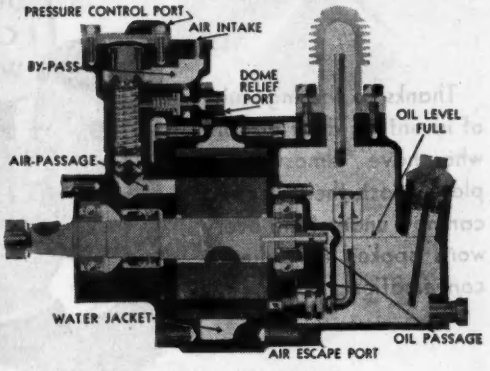
...That's Why They Are FIRST in Economy and Reliability

The Wagner Rotary Air Compressor used in Wagner Air-Brake Systems is one of the outstanding developments achieved in the field of automotive air-brake equipment. This revolutionary type of air compressor utilizes the rotary principle to compress the air needed in the air-brake system, and its high efficiency is largely responsible for the absolute dependability of Wagner Air Brakes.

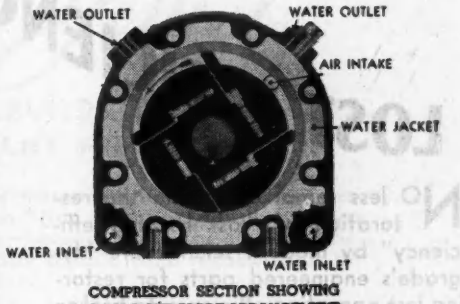
POINTS OF EXCELLENCE OF THE WAGNER ROTARY COMPRESSOR...

1. . . Rotary Motion–no reciprocating parts.
2. . . Perfect running balance at all times.
3. . . Longer belt life due to more uniform torque loading.
4. . . Low friction losses – therefore high operating efficiency.
5. . . A predetermined air pressure automatically maintained.
6. . . Operating parts are long-lived; consequently long life and low maintenance cost.
7. . . Extremely quiet in operation.
8. . . Self-contained oiling system – consumes practically no oil.
9. . . Compact – requires minimum installation space.
10. . Low operating temperature prevents carbon formation in the compressor and delivery lines.
11. . Wagner Air Brakes are adaptable to all types of automotive brake systems.

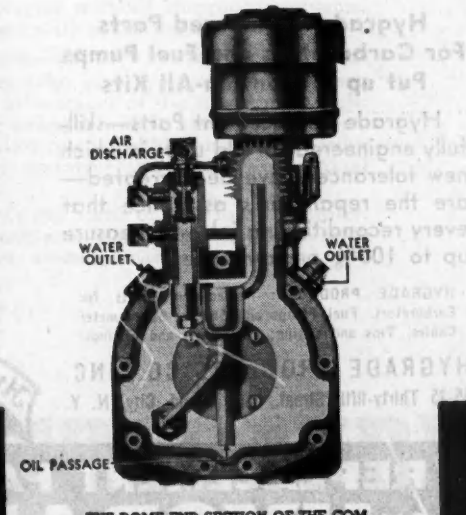
Thousands of Wagner Air Brakes are giving outstanding service on trucks, tractors, trailers, and buses – and are establishing enviable performance records. You, too, can lower brake maintenance and increase the brake efficiency of your vehicles by installing Wagner Air Brakes. Wagner is a national organization and can render field engineering service from any one of its 25 branches located in principal cities.



SECTIONAL SIDE VIEW OF COMPRESSOR ASSEMBLY



COMPRESSOR SECTION SHOWING ROTOR AND BLADE ARRANGEMENT



THE DOME END SECTION OF THE COMPRESSOR SHOWING OUTER CHECK-VALVE AND AIR-OUTLET TUBE ASSEMBLY

***Write for Bulletin* KU-50**

IT CONTAINS COMPLETE INFORMATION.

The System With The Rotary Compressor

K44-4

Wagner Electric Corporation

ESTABLISHED 1891

6470 Plymouth Avenue, St. Louis 14, Mo., U. S. A.

AUTOMOTIVE AND ELECTRICAL PRODUCTS

CODDLE SYNTHETICS WITH GENUINE TIRE PM

(CONTINUED FROM PAGE 182)

tions in using reclaim but it should be borne in mind that as the percentage of reclaim in relation to the rubber or synthetic goes up, the ultimate tread wear goes down and in a general way it can be stated that an all-reclaim retread will give only about one-third of the mileage of a 100 per cent synthetic or rubber retread and the various percentage relationships of reclaim will give proportionate mileage.

Up to the present time the only WPB regulations for camelback for truck tires is "A" grade but as a matter of information, when "C" grade camelback has been used, the mileage runs about 30 per cent less.

For repairs on tires made of synthetic bodies, the procedure of repairing is the same as for tires having rubber bodies. The repair materials may be of either synthetic or rubber, the only special feature is that there must be a layer of rubber cushion between the repair and the material that is used. As with sectional repairs on rubber tires, truck operators should use repaired synthetic casings on easy positions where loads are not too heavy and speed is not too great.

Reconditioning Tubes

The problem of repairing synthetic rubber inner tubes is divided into two groups due to the fact that some tubes are made of GR-S (which has a red identifying stripe on the base side of the tube) and others are made of GR-I (which has a blue identifying stripe on the base side of the tube).

The GR-I (Butyl) tubes are quite easy to repair; in fact, the procedure is not substantially different from that of natural rubber tubes.

On the other hand, the GR-S (Buna S) tubes require rather special treatment because of the greater tendency of the GR-S rubber to tear easily. To make a repair that won't tear, we have to use a sandwich patch, that is, the repair patch material should be applied both inside and outside. The cold patch method should only be used as an emergency. At the operator's earliest opportunity, a properly cured patch should be substituted, since cold patches will not hold for more than a couple hundred miles.

We can interpret our test fleet experience in predicting truck operator experiences approximately as follows:

Delivery truck sizes which are made in the S-3 construction will in average service deliver mileage performance substantially equal to the service of tires made of rubber. Tread wear will be substantially the same, since the tires are only four and six ply and the heat build-up is not likely to be troublesome.

Premature body failures can be troublesome if the tires are over-inflated or abused on rough highways. There may be a tendency for tread cracking and radial sidewall cracking to develop late in the life of the tire.

The sizes used on light trucks and the small buses are likewise of S-3 construction. They can be expected to give substantially equal service for tread wear and in general perform

(TURN TO PAGE 186, PLEASE)

Thanks to the ingenuity of inventors, deaf persons who have almost completely lost their hearing can now understand every word spoken in ordinary conversational tones.

LOST EFFICIENCY RESTORED

NO less remarkable than the restoration of "lost hearing efficiency" by modern science are Hygrade's engineered parts for restoring lost operating efficiency to broken down carburetors and fuel pumps.

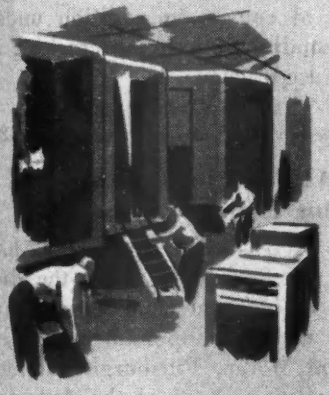
Hygrade Engineered Parts For Carburetors and Fuel Pumps Put up in Contain-All Kits

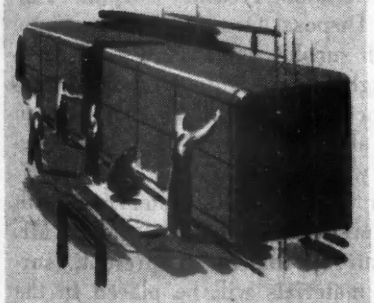
Hygrade Replacement Parts—skillfully engineered for old units in which new tolerances have been created—are the repairman's assurance that every reconditioning job will measure up to 100% performance.

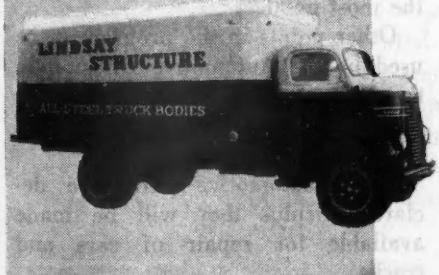
HYGRADE PRODUCTS: Replacement Parts for Carburetors, Fuel Pumps and Shocks; Speedometer Cables, Tips and Casing; Fuel Lines and Fittings.

HYGRADE PRODUCTS CO., INC.
35-35 Thirty-fifth Street, Long Island City, N. Y.

REPLACEMENT PARTS by HYGRADE
ENGINEERED for OLD UNITS







It will pay you to *Get Acquainted with Jim!*

...YOUR NEIGHBOR WHO BUILDS TRUCK BODIES AS YOU WANT THEM

Here is a new idea in truck body manufacturing. It combines personalized service with mass production. "Jim"—your neighbor—has been selected as your local Ls body builder—because he has the ability, capacity, and understanding to intelligently handle your requirements for one . . . or a thousand truck bodies.

Dependable local service. Jim can take time to style your truck body to your individual requirements. He knows local conditions and regulations thoroughly, makes quick deliveries without shipping problems, does a factory job of repairing for you—with easily replaced parts.

Ls truck bodies made to your measure—but with mass production advantages. "Jim" is the only builder who gives you modern Lindsay Structure bodies—providing all the advantages of the die-formed, light metal construction, with its amazing strength-weight ratio. If you operate a national fleet, any of the Ls dealers can build identical bodies from master specifications anywhere in the country—and give you individual local service as well.

Get in touch with Jim—we'll supply the name of your local Ls dealer. Write to **Lindsay and Lindsay, Adams-Franklin Building, Chicago 6, Illinois; or 60 East 42nd Street, New York 17, New York; Lindsay Structure (Canada) Ltd., 307 Dominion Square Bldg., Montreal.**

LINDSAY Ls STRUCTURE

U. S. Patents 2017629, 2263510, 2263511
U.S. and Foreign Patents and Patents Pending

DISTRIBUTORS AND DEALERS THROUGHOUT THE COUNTRY

CODDLE SYNTHETICS WITH GENUINE TIRE PM

(CONTINUED FROM PAGE 184)

more or less the same as those in the delivery truck sizes under normal operating conditions. However, in this group, due to the thicker tread and greater number of plies, tread separation and premature body failures will be somewhat more prevalent under unfavorable operating conditions.

The group of sizes used on medium trucks and trailers constituting the larger vehicles engaged in inter-city hauling and inter-city bus operations have been the basis of by far the largest proportion of our road and laboratory testing. At present, we are in production on the S-7 construction using 40-60 per cent synthetic and sometime during the summer or fall will have to make the move to the S-6 construction using 70 per cent synthetic.

We tire people have satisfied ourselves that S-7 tires used under favorable operating conditions will do a good job; possibly not quite so many miles as rubber tires but certainly good enough so that truckers will not have much cause for complaint. The catch is, however, that they will not stand abnormal operating conditions to the same degree that rubber tires will and by this I mean overloading, overspeeding, or improper inflation or any combination of these. Even though the tires are made of rayon, if the operating conditions are unfavorable, premature separation and body failures will be decidedly more prevalent in the synthetic constructions.

We find that the rate of tread wear with synthetics is affected by the seasons; that is, synthetic tires run in winter have a rate of tread wear almost comparable with rubber. On the other hand, synthetic tires run in summer have a faster rate of wear with somewhat less total mileage. Then, of course, in addition under heat conditions the tread cracking is much accentuated.

END

(Please resume your reading on P. 52)

Successful results are obtained by concentration on one objective.
P & D has concentrated on manufacturing quality ignition replacement parts for trucks, busses and passenger cars . . . or anything driven by motors.
Many service station owners and mechanics know they are best helping by concentrating on P & D products to maintain and increase profitable operation . . . for their customers as well as themselves, because the three benefits of concentration are always there with P & D.

3 P&D BENEFITS
1. Minimum inventory, because one complete line.
2. The best is always at hand, because P&D make only one quality . . . the finest.
3. Customer satisfaction, because good work plus P & D parts means peak performance.

YOU CANNOT PURCHASE ANY FINER QUALITY 3743

GENUINE P&D IGNITION PARTS

P & D MANUFACTURING COMPANY, Inc.
LONG ISLAND CITY, NEW YORK
STARTING · LIGHTING · IGNITION
REPLACEMENT PARTS
P & D MANUFACTURES ONE COMPLETE QUALITY LINE ONLY THE FINEST MATERIALS AND WORKMANSHIP OBTAINABLE ARE EMPLOYED

Lee William Moran Heads Surplus Property Disposal

The Treasury Department has taken the first step toward the disposal of wartime automotive surpluses with the appointment of Lee William Moran, Pittsburgh automobile dealer, as head of the Automotive Division, Treasury Surplus Property Disposal Organization in charge of all surplus automotive goods. Although his appointment was not announced until June 28, Mr. Moran had already been on the job for several weeks.

In an exclusive interview with COMMERCIAL CAR JOURNAL, Mr. Moran said that for the present, "surplus materials will be placed in the hands of dealers to relieve critical shortages in areas where they will do the most good."

Other points in the program to be used by the Automotive Division in the disposal of automotive goods are:

1. Deal with normal channels of trade.

2. As automotive parts are declared surplus they will be made available for repair of cars and trucks.

(TURN TO PAGE 188, PLEASE)

Distinctive in color and in quality! That means every re-wire job done with Wiry Joe's new maroon ignition cable looks better—*and is better!*

Insulation having outstanding dielectric properties reflects real advances by Wiry Joe in the compounding of synthetic rubber. And Wiry Joe braids are made of soft, combed, or super-carded yarns of first quality—coated as many as twenty-four times with a special lacquer. This means an outer covering that assures maximum protection for the insulation—a covering that is highly resistant to heat, cold, gasoline, oil, grease, moisture, salt air.

Ask your jobber about Wiry Joe's maroon primary and high tension cable—it's the answer to many ignition problems. Look for the announcement of other Wiry Joe innovations soon!

Wiry Joe

AUTOMOTIVE CABLE

manufactured by

THE CRESCENT COMPANY, Inc.

Pawtucket, Rhode Island

√ Check the wire on every job!

(CONTINUED FROM PAGE 186)

3. Get automotive surpluses off government hands and funds into the Treasury.

Mr. Moran said his division will handle the disposal of automobiles, trucks, combat vehicles, replacement parts, maintenance equipment, tires and all other types of automotive equipment.

He pointed out that up to the present time the only large surplus problem the Treasury Disposal Unit has been called upon to handle has been the sale of trucks which have become surplus to the needs of the military services. These trucks are being sold on a regional basis with the cooperation of ODT, AAA and other organizations as has been outlined in these pages previously.

They are being sold through the regional offices of the Treasury Procurement Division and this procedure will continue to be used in the disposal of all automotive surpluses. Mr. Moran said that although he was building a new staff and setting up policies his group would "dovetail with the existing Treasury Procurement set-up."

The new Automotive Division director also said that if a large quantity of trucks or other automotive equipment was available at a particular place it would be sold on the spot and Treasury agents would be moved in to handle the sale rather than move the material to the nearest regional office.

Lee William Moran

During the month of June more than 3000 trucks were disposed of to essential users, according to figures quoted by Mr. Moran. Over 1000 were sold in Texas to aid in crop harvesting. Trucks are sold in "as-is" condition and within OPA ceiling prices.

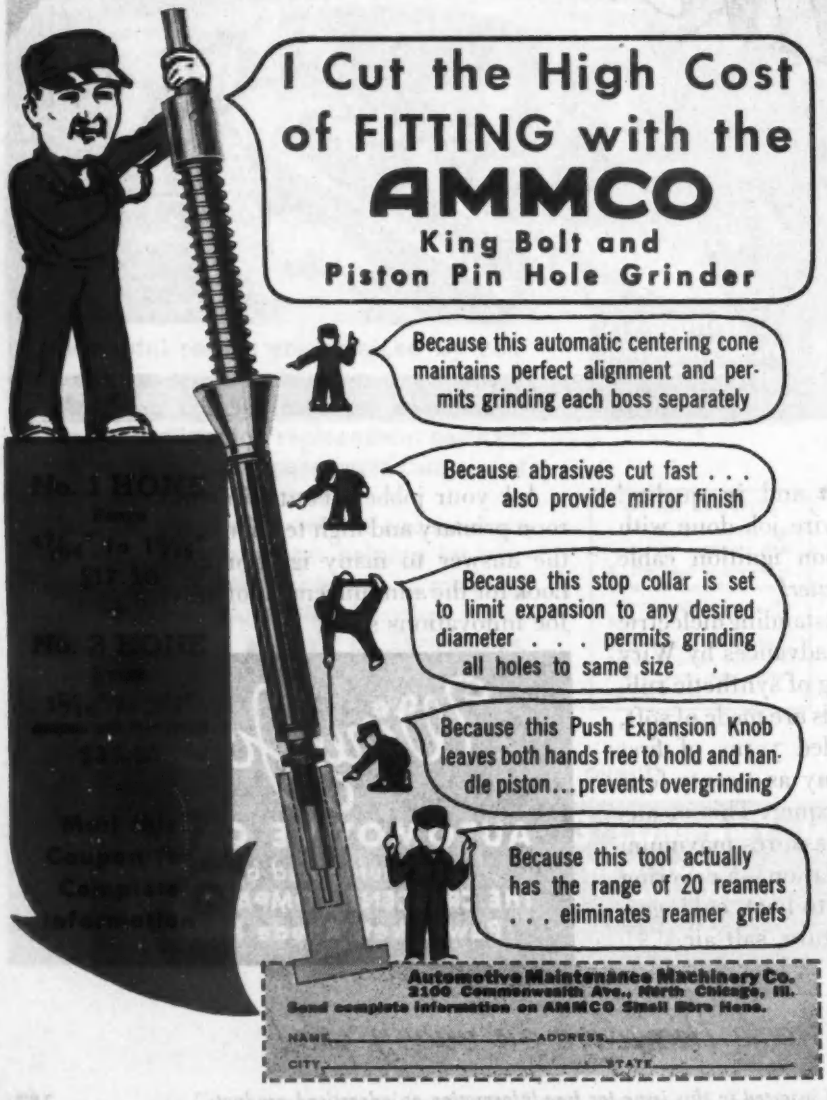
Passenger vehicles, maintenance equipment, tires and combat vehicles have not been available in sufficient quantities to have raised any real problem.

While only negligible quantities of parts have been available, Mr. Moran's plans for disposing of parts surpluses should be of interest to the entire automotive industry. He said that an attempt will be made to get "parts into the hands of the manufacturers for redistribution." The Treasury Department has already experienced moderate success in selling new goods, in other lines, back to the original manufacturers. Whether manufacturers will be interested after production controls have been lifted is a moot question.

Mr. Moran said that damaged vehicles have been providing small quantities of parts to relieve current shortages. These vehicles are in a

(TURN TO PAGE 191, PLEASE)

Grind King Bolt, Piston, Conrod Bushings and 75% of Hydraulic Brake Cylinders . . .


I Cut the High Cost of FITTING with the AMMCO
King Bolt and Piston Pin Hole Grinder
Because this automatic centering cone maintains perfect alignment and permits grinding each boss separately
Because abrasives cut fast . . . also provide mirror finish
Because this stop collar is set to limit expansion to any desired diameter . . . permits grinding all holes to same size
Because this Push Expansion Knob leaves both hands free to hold and handle piston... prevents overgrinding
Because this tool actually has the range of 20 reamers . . . eliminates reamer griefs
Automotive Maintenance Machinery Co.
2100 Commonwealth Ave., North Chicago, Ill.
Send complete information on AMMCO Small Bore Hone.
NAME
ADDRESS
CITY
STATE

(CONTINUED FROM PAGE 188)

different category, but are sold in much the same as are serviceable vehicles. For example, in a recent sale of several hundred trucks at one particular location, about 20 per cent of the total number were unserviceable, but were sold for parts replacement purposes and not highway use.

Mr. Moran comes to his position in the Treasury Department with a record of 25 years' active work in the industry and undoubtedly this experience will stand him in good stead in disposing of some portion of the huge amount of automotive equipment purchased by the armed services. He began as an automobile salesman in 1919 and is now head of his own firm in Pittsburgh, also past president of the Pittsburgh Auto Dealers Assn. and a director of the Pennsylvania Automotive Assn.

FILTERS VS. HOT AND COLD SLUDGE

(CONTINUED FROM PAGE 42)

amounts will settle out of oil that appears clear. This resin not in solution can be readily filtered out whether it is attached to solids or not.

In cold weather there is almost always some water present in crankcase oil. There are other much better ways of doing it, but water can be filtered from oil with almost any filter (not screen). When water emulsions are formed in used oil, especially in the presence of carbonaceous matter, a sticky mass is formed. This is caused by curdling due to water. Without the water this sticky mass is not nearly so apt to form.

To summarize the above:

1. Abrasives should be filtered out as quickly as possible. This means a high clean oil flow rate.

2. Resins are thrown out of solution by the addition of new oil, water or by dilution, and in this form can be readily filtered out.

3. Filters not containing activated material remove additives, only as solids with additives adhering are removed.

In discussion, T. A. Drescher, Manager of Transportation, Borden's Farm Products Co., New York City, made the following comment:

"For a number of years our entire fleet of 3000 commercial motor vehicles has been operating on a 100 per cent filter-equipped basis.

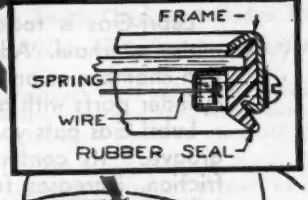
Oil filters may serve the purpose of removing a large portion of insoluble contaminants from the engine lubricant, but there is always the problem of oil temperature control at the filter. This problem is not as serious in warm weather as it is during the winter months in the New York area, because the temperature gradient between the crankcase oil and atmosphere is not sufficient to thoroughly chill the oil at the filter. Cold weather plays havoc with the functioning of this accessory, and oil filtering temperatures on the engine must be given serious attention before we receive full benefits. It is questionable whether significant quantities of crankcase oil ever circulate through some filters in proportions advocated by the manufacturer.

END

(Please resume your reading on P. 43)

Production Release

FULTON "44" Electric DEFROSTER



NEVER before has there been such an urgency as *today* . . . for truck and car operators to maintain high standards of SAFE DRIVING. Irreplaceable vehicles . . . each a vital unit of transportation . . . must be safeguarded to the last degree.

In order to help meet this critical situation, permission has been granted under the provisions of Order L-158, for the production of a limited number of Fulton Electric Defrosters.

This Defroster . . . the Fulton "44" . . . will be available for fall delivery. Among its features are: (1) New type air-seal between glass and frame, which prevents frost or condensation "leakage" onto windshield or defroster panel; (2) new type, concealed spring-tension mountings for heating wires . . . maintaining constant tension and neutralizing contraction and expansion.

This Defroster maintains clear vision against frosting and misting WITHOUT heat. Current is turned on only for melting snow or ice on the OUTSIDE of the windshield.

Developed for wartime use on essential vehicles, the Fulton "44" Electric Defroster is in the vanguard of vital automotive equipment that will continue its service for years to come. For fullest reliability, this type of defroster was selected by the Ordnance Dept. for use on army trucks.

CLEAR VISION IS THE FIRST ESSENTIAL TO SAFE DRIVING AND MORE THAN EVER SAFE DRIVING IS THE FIRST ESSENTIAL TO UNINTERRUPTED TRANSPORTATION!

Due to government restrictions and the unavailability of copper wire, defrosting FANS cannot be manufactured at this time. The Fulton "44" Electric Defroster, however, offers "clear vision" protection under all weather conditions.

THE FULTON CO. 1912 South 82nd Street Milwaukee 14, Wisconsin

Breen Gets Red Star

Maurice Breen of New Orleans, sales and service representative for Barrett Equipment Co., St. Louis, and recently of the Merchant Marine, has received for heroism the Russian Order of the Red Star, third highest award of the Soviet Union.

Serving with the Merchant Marine, Breen took part in a week-long battle during a mission to Murmansk, Russia. As a purser whose duties did not require his participation in combat, he nevertheless serviced a machine gun, bringing down an enemy bomber before it could launch its missile.

Award of the medal entitles Breen to special privileges throughout the Soviet Union such as free, first-class passage on all tramways, trains and steamers, and carries with it a pension of 180 rubles a year, about $36 in United States currency. Breen also holds the Distinguished Service Medal of the American Merchant Marine, highest award of that service.

PREMIUM QUALITY GASOLINE

Plus a Perfect Break-In Oil

Lubri-Gas is today's answer for proper lubrication after a motor overhaul. Added to your gasoline, it enters the combustion chamber as an oil fog which condenses and bathes all upper cylinder parts with a clean oil film.

Lubri-Gas puts your new and newly overhauled motors "in the groove." Its continued use helps to prevent carbon, reduces friction, increases fuel mileage and adds pep to *all* motors. Lubri-Gas keeps your cars and trucks on the road and out of the repair shop.

LUBRI-GAS TREATED GASOLINE *Cleans and Lubricates as It Powers the Motor*

Lubri-Gas treatment introduces a carbon and sludge dissolving lubricant as a clean unburned oil fog—with the fuel. Improves ignition. Frees sticky valves. Increases compression. Prevents blow-by and oil dilution. Reduces friction between piston rings, piston, cylinder. Prevents overheating. Increases power, SAVES WEAR, REPAIR, GAS, OIL.

• Anti-Friction • Anti-Knock • Anti-Carbon • Anti-Sludge

LUBRI-GAS

221 N. LaSalle St., Chicago 1, Ill.

AMONG TODAY'S USERS OF LUBRI-GAS

International Harvester Co., Rock Island, Ill. Rock Island Arsenal, Rock Island, Ill. Stone & Webster Construction Co., Knoxville, Tenn. Ossman & Norman, Madison, Wisc. State and County Highway divisions of: Illinois, Ohio, Indiana, Texas, Montana, Kansas, Iowa. Yellow Cab Company, Louisville, Kentucky. Memphis Army Services Forces and various U. S. Army Engineers and other U. S. Army divisions. Norwalk Truck Lines, Norwalk, Ohio. Schulze Baking Company, Chicago, Illinois. Keeshin Motor Express Co. and Huber and Huber Motor Express.

Registered Trademark

Get the facts, today!
Write, wire or telephone
LUBRI-GAS
221 No. La Salle St., Chicago 1, Ill.

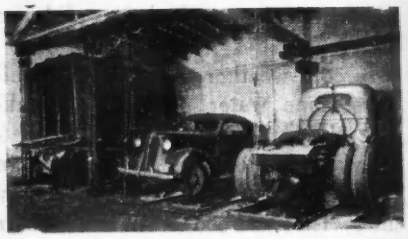
New Booklet on Child Labor Laws Available

A revised and clarified Summary of Federal and State Child-Labor Laws and Regulations, affecting employment in transportation and associated industries, has been prepared and issued by the ODT.

The publication includes the changes in child labor legislation—both federal and in all the states—made during the past year. Many of these changes, it is pointed out, reflect a slight relaxation with regard to hours of work and working permits. In a few cases, the age limits of drivers of motor vehicles has been changed. However, it is explained, there is no change in the occupations considered hazardous for minors.

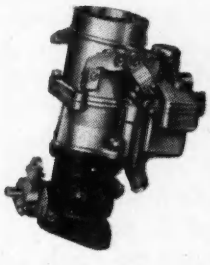
A list of all the state officials from whom age certificates must be obtained, is included.

Copies of the summary may be had by application to the Division of Transport Personnel, Office of Defense Transportation, Washington 25, D. C.



It's a far cry from buggy springs, springs for horse-drawn drays, and seat springs for the Indians, to big springs for motor trucks. But that has been the evolution of the spring making art for something like 65 years in the history of the Tuthill Spring Co., Chicago, Ill. Besides making springs for heavy duty trucks and trailers Tuthill runs a service establishment across the street from the main factory for the benefit of fleet operators. Here on a small scale is found the same kind of equipment that is used for making production springs. The difference is that the machinery is more adapted to making individual pieces, mostly one of a kind. Limping vehicles are hauled to the service station where they are driven over service pits to facilitate the removal of the broken springs. These springs then are taken to the factory section of the service department where they are disassembled and preparations are made for the replacement of broken leaves or the entire assembly if need be. Such replacements are tailor-made from high grade spring steel stock. Forms and equipment are available to reproduce broken parts faithfully to the original size and shape so that the repair job is the same as it was when new.

A SURE-FIRE WAY TO CUT GASOLINE COSTS!



Here's a positive, definite way to cut gas costs—proved in actual service by many vehicle operators.

Put all your vehicles on a *regular program* of carburetor servicing. Cleaning, adjusting, repairing, and testing—*expertly* done at *regular intervals*—prevents corrosion, leakage, clogging, carbon formation, misfiring and gas wastage.

THIS IS IMPORTANT: Be sure you have this work performed in a qualified shop—a Zenith Authorized Service Station. Their mechanics are *specially trained* in carburetor maintenance. They're equipped with the correct tools, special cleaning solvents, and adequate stock of repair parts. They have the right to use a *patented* cleaning process which safeguards the coating that protects carburetor castings against rapid corrosion. Ordinary cleaning methods often destroy this protection.

And they carefully check every carburetor against the 9 Vital Points of Carburetor Maintenance.

It's simple and easy to start this gas-saving service. Do it today by calling your nearest Zenith Authorized Service Station *now.*

Every Zenith Check-up Includes These 9 Vital Points of Carburetor Maintenance:

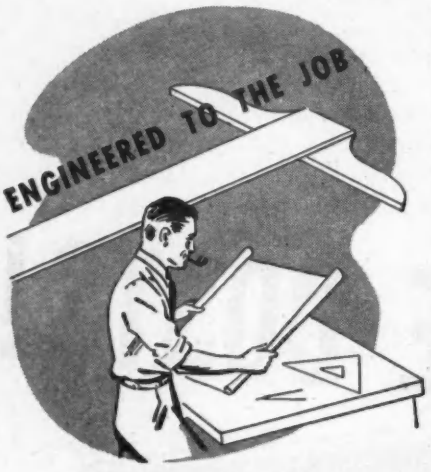
1. Thorough cleaning of bodies and parts without injuring the corrosion-resistant dichromate finish on die castings.
2. Careful inspection of channels and passages to insure proper fuel flow.
3. Cleaning of small parts with special solvents which will not destroy calibrations of metering orifices.
4. Inspection of castings for warpage or distortion of surfaces. Precision resurfacing of faces when necessary.
5. Proper inspection of throttle shaft and bearing. Elimination of excessive air leaks.
6. Careful cleaning of idling system and properly inserting throttle plate in relation to idling part.
7. Inspection of vacuum system, accelerating pump, etc.
8. Inspection and proper servicing of float systems.
9. Complete checking operation after repairs, adjustments, and reassembly.

ZENITH CARBURETOR AUTHORIZED SERVICE

LOOK FOR THIS SIGN for Prompt, Thorough Carburetor Service.

Bendix

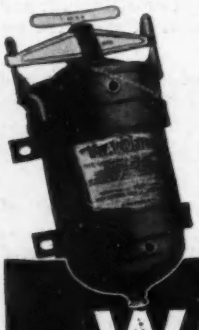
ZENITH CARBURETOR DIVISION, Detroit, Michigan



WGB CLAROFIERS

FOR BETTER LUBRICATION, LONGER

The oil lasts longer—and so does the engine. Here's the reason. The exclusive WGB cartridge removes from oil not most, but *all,* the enemies of engine-life—dirt, sludge, water, harmful acids, colloidal carbon. It is easily installed by hand, without tools, and replacements cost less than oil changes. Heavy-duty WGB Clarofiers, for all gas and Diesel engines, are rugged, simple in design and operation, and each model is specifically designed for the job it has to do. Bank on the proved reputation of WGB oil clarofying. It saves time, money, overhauls, oil, and irreplaceable engine parts.



Free book describing low-cost WGB oil clarofying—for gas and Diesel engines—is yours for the asking.

WGB

OIL CLARIFIER, INC.

KINGSTON, N. Y.

LET'S KEEP SEDIMENT OUT OF LUBRICATION

WASHINGTON RUNAROUND

(CONTINUED FROM PAGE 36)

serve as an application, a certificate of transfer and as a record for inventory control. One sheet of paper would do the work of many sheets under the previous WPB system. Also under consideration is a move to cut out substitution of another truck make after a particular make has been applied for and granted. Substitutions ball up the works. Under the proposed method they would be granted only upon notarized certification that the make originally requested is not available. Another proposal under consideration would eliminate makes entirely from applications for trucks in the range from 9000 lb. G.V.W. up to but not including 16,000. This, presumably, would apply to light trucks when they became available.

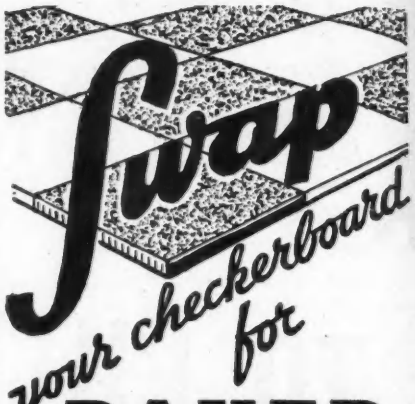
Deadwood and Livewood

The Los Angeles office of the OPA has informed the ODT that 17,000 persons who operated trucks, or what purported to be trucks, have failed to apply for gas rations. . . . ODT's budget for the fiscal year is approximately 16 millions, of which 14 millions is earmarked for motor transport. . . . ODT Regional Managers have received salary raises from $6,500 to $8,000 a year, and two assistants at $6,500 each. . . . Sale of premium gas reached 40 per cent of total sales early this year compared with a peacetime percentage of 15. The 50 per cent production cut ordered by PAW will bring it in line with pre-war practice. . . The light truck pool will be exhausted by Aug. 15. Thereafter applications will be accepted by ODT if accompanied by a dealer statement that the truck is on hand. This recognizes the belief that inventory statistics are not perfect.

END

(Please resume your reading on P. 37)

B. D. Berk, who is now zone manager for the Lynch Mfg. Corp. covering eight mid-western states, with headquarters in Chicago.

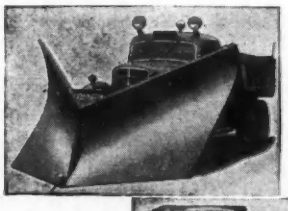


BAKER SNOW PLOWS

When it snows, put away your checkerboard and pinochle deck and get out your Baker Snow Plow to keep your routes open so trucks can roll.

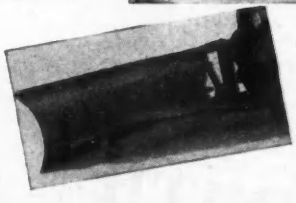
It costs money, aggravates customers and impedes the war effort when deliveries are missed or delayed. Used perhaps only once or twice a year, Bakers easily pay for themselves.

Available under current priority regulations. Send for Bulletin 829.



"V" type for 1½ to 5 ton trucks.

One-Way Landside Types for trucks of 1½ tons and up.



Reversible Trip-Blade Types for 1½ to 3 ton trucks.

THE BAKER MFG. CO.

571 Stanford Ave.

Springfield, Ill.

BAKER TRUCK & TRACTOR SNOW PLOWS

PIERCE GOVERNORS

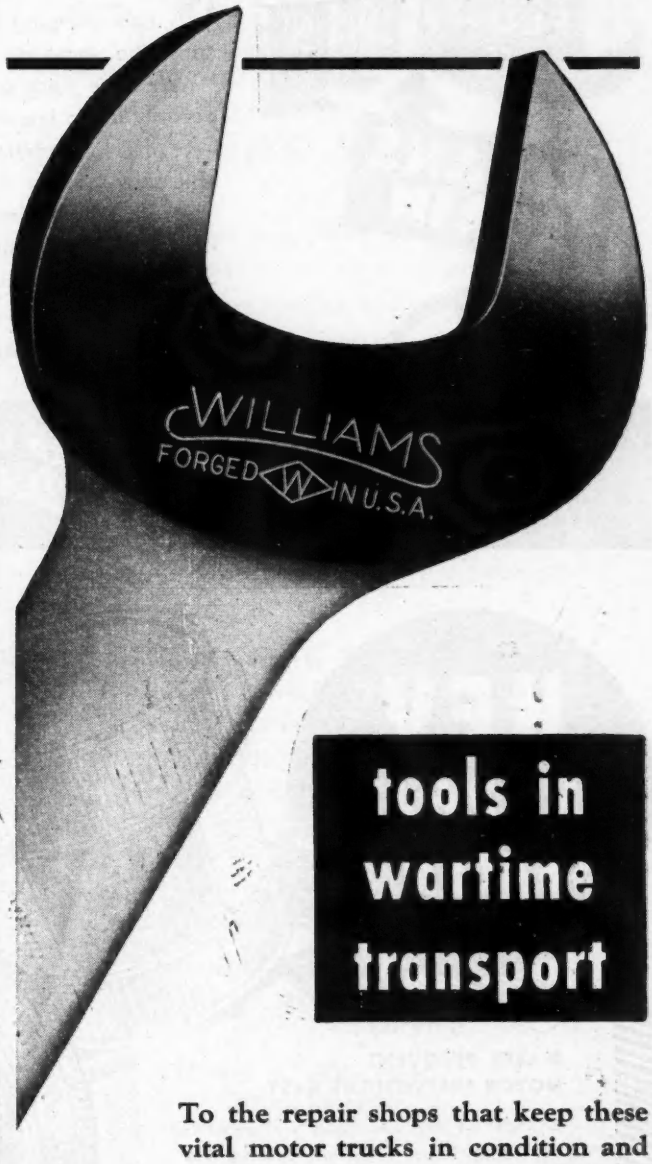
PIERCE FLYBALL GOVERNORS are precision instruments, built by the world's largest governor manufacturer to do a better job of controlling and protecting internal combustion engines for a longer period of time. With positive, *mechanical* response to load conditions, they may be depended on for close, accurate regulation throughout their long, trouble-free service life. If your equipment is not now Pierce-governed, write for complete information—giving data on the make and model of your engines.

★

THE PIERCE GOVERNOR COMPANY, INC.
1611 OHIO AVENUE • ANDERSON, INDIANA

Canadian Manufacturer and Distributor:
Burlec Limited, Toronto 13, Canada

Manufacturers of Pierce Precision Governors and Sisson Automatic Chokes



tools in wartime transport

To the repair shops that keep these vital motor trucks in condition and operation, Williams tools render a superior service. Here Williams 60 years' reputation for dependable and efficient tools is proven every day... every hour... every minute.

"How to Select and Use Wrenches" is a fountain of factual information. Write for it today.

J. H. WILLIAMS & CO. • BUFFALO 7, NEW YORK

WILLIAMS
SUPERIOR DROP-FORGED TOOLS

DROP-FORGINGS & DROP-FORGED TOOLS

EIS Super "40" BRAKE FLUID

IN CANS AGAIN

NO more glass containers! We are now shipping Eis Super "40" in cans, the same as in pre-war days.

While we were compelled to temporarily use a less efficient container—to meet a wartime situation—the efficiency of the contents was not lowered. We shall never deviate from the high standards for which Eis Super "40" is famous.

EIS MANUFACTURING CO.
MIDDLETOWN, CONN.

EIS
BRAKE PARTS
BRAKE FLUID
BRAKE TOOLS
for a Better Brake Service

KEY GRAPHITE SEALER

MAKES FREQUENT MOTOR INSPECTIONS EASY

Cylinder heads come off in a jiffy—without using force — without tearing the gasket. Key does not affect gaskets; they can easily be removed and reused many times.

Key also protects crankcase, differential, transmission and manifold gaskets and keeps all oil and gasoline connections leak-proof. It is a valuable aid to keeping your fleet in trim.

A free sample is yours for the asking.

KEY COMPANY
EAST ST. LOUIS, ILLINOIS
2612 McCASLAND AVENUE

NEW PRODUCTS

(CONTINUED FROM PAGE 59)

advantages of floor protection and decrease of noise in operation. The casters and a rigid metal bar permit swinging the dolly in any direction, and enable a mechanic to remove a dual wheel set within a space of less than four ft. between vehicles.

Elevating arms are raised and lowered by means of a hydraulic jack, permitting the picking up of a wheel from the floor or up under a jacked-up wheel. The distance between elevating arms is adjustable to accommodate wheels from 36 to 44 in. in diameter.

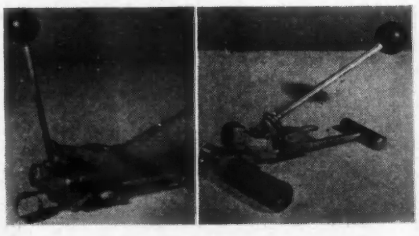
When the dolly is in position, all of the mechanical assembly is below the wheel hub, providing ample clearance so that all types of wrenches may be used without interference.

The vertical frame is adjustable horizontally, permitting lining up or positioning of wheels so that they may be pushed straight on the axles. A tray is attached to the vertical frame for convenience in storing wheel bolts.

Use Free Postcard for More Details.

P248. Hose Clamping Tool

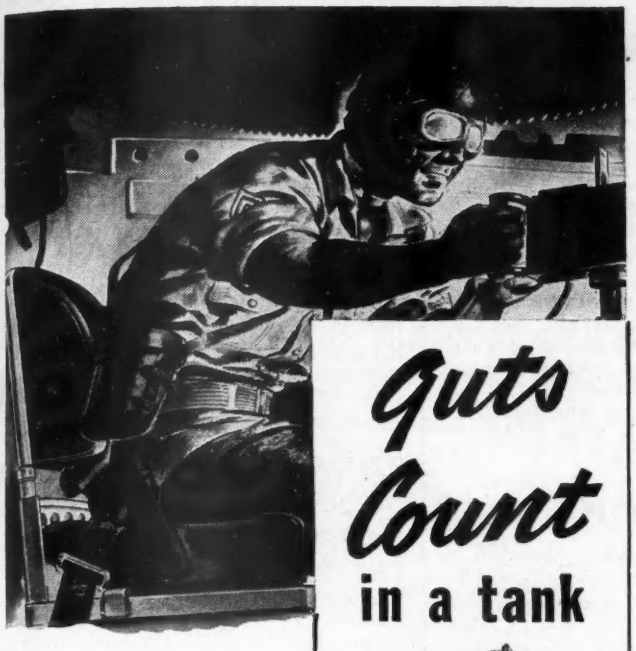
The new Punch-Lok hose clamping tool, made by Punch-Lok Co., Chicago, is a mechanical device for connecting various kinds of male and female fittings, special nipples, menders or ordinary pipe to hose. All



hose from the modern high pressure wire woven and braided hose to ordinary air and water hose may be fitted with this streamlined clamp.

Punch-Lok hose clamps and fittings have been engineered to make application possible without injury to the hose itself, and the manufacturer states that, once the clamp has been locked, neither vibration nor rough handling can loosen it. In making the connection, a broad flat high-tensile-strength galvanized-steel band is double-wrapped around the

(TURN TO PAGE 248, PLEASE)



Guts Count in a tank

*That's why American Seating Co. upholsters tank seats with long-wearing protective P. C. "CAVALON"**

IT'S A RUGGED JOB, in a tank. It takes steel and sinew and strength. It's a job for a man with *guts* . . . and a job for equipment that can take it.

Such equipment is the seat a tankman sits on, upholstered in Du Pont P.C. "Cavalon." For this upholstery is tough. It takes abuse. Lots of it. And it gives maximum comfort and protection to tankmen on a rough ride.

This is just one quick picture of P.C. "Cavalon" in the war. It's serving our fighting men also in countless other ways, all over the world. Here are just a few of the reasons why. P.C. "Cavalon" is—

1. **Resistant to general** abrasive wear.
2. **Resistant to edge wear** and edge cracking along *beading* and turned edges where material is sewn.
3. **Resistant to peeling** and cracking of the coating when seat is constantly flexed.
4. **Free from exudation** and tackiness when subjected to elevated temperatures.
5. **Sanitary,** non-absorbent, and easy to clean with soap and water.

For your information, P.C. "Cavalon" meets and surpasses the requirements of Federal Specification E-KKL-136A, Type 3, Class A and B. Special *fire-resistant* P.C. "Cavalon" meets Army Air Corps Specifications 12026A; Bureau of Ships *ad interim* Specification 34L-13 (int.); U. S. Army Ordnance Dept. AXS-992 (Revision #1); and Maritime Commission Specification MN245.

War service—and war research—mean an even more versatile P.C. "Cavalon" tomorrow. A "Cavalon" that will hold leadership as a tough, good-looking, heavy-duty fabric for many of your upholstering needs. Using it, you'll give your products *longer life* and better value. E. I. du Pont de Nemours & Co. (Inc.), "Fabrikoid" Division, Empire State Building, New York 1, New York.

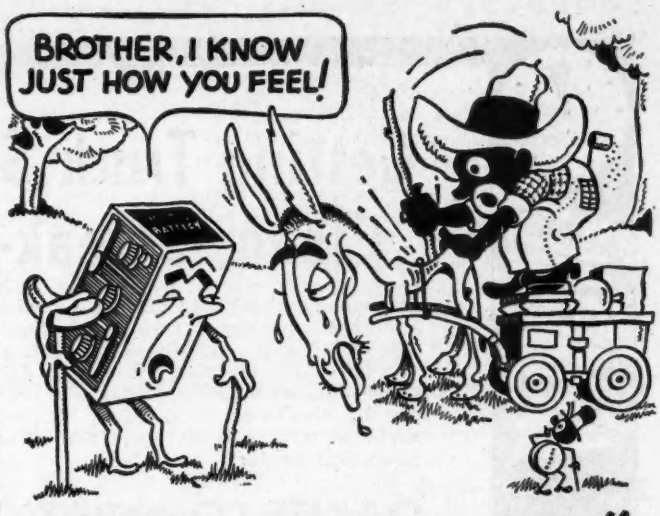
***P. C. "CAVALON"** *is Du Pont's trade mark for its plastic coated fabric.*

P.C. **DU PONT "CAVALON"**

DU PONT

plastic coated fabric

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



BOTH IN THE SAME FIX!!

The moral is: a battery needs regular "feeding" just as much as a jackass if it's to keep on delivering power to a car's ignition and lighting system.

Batteries will give much longer service if you check them regularly, keep them charged properly. When a new battery is needed, install one with real *staying power* — Edison, *the battery with the greatest name in electricity back of it.*

CHECK UP TO SEE THAT—

1. **Batteries in stock are given periodic freshening charges.**
2. **Batteries in service are checked every two weeks. With restricted mileage, batteries will need more recharging.**
3. **The proper size battery is on the job.**
4. **The water-level is maintained.**
5. **NEW BATTERIES ARE FULLY CHARGED BEFORE BEING INSTALLED IN ACTIVE SERVICE.**

THOMAS A. EDISON, INC.
Emark Division
Plant No. 1, Kearny, N. J.

YOU CAN ALWAYS RELY ON AN EDISON

The greatest name in Electricity

Edison

ALLIED VICTORY PROGRAM
WE PRODUCE
Thomas A. Edison INDUSTRIES

Getting Truck Surfaces Clean, Streak-Free!

In washing truck and taxicab exteriors, you naturally prefer a washing material that does a thorough job. Loosening and removing road dirt, grime and grease is a first consideration. But other factors, such as the time required and the safety with which the material can be employed on painted, lacquered or enameled surfaces, are equally important. That is why many operators prefer

OAKITE COMPOSITION No. 70

This material rinses freely and washes thoroughly. It leaves surfaces clean, streak-free. In addition, it is fast-acting and safe. The original color of the finish is preserved.

Our Automotive Servicing Manual gives full directions for using. You will find the manual also helpful in expediting degreasing of repair parts, cleaning motors and chassis, reconditioning clogged radiators and cooling systems, and keeping garage floors grease-free. Write for your copy today.

OAKITE PRODUCTS, INC., 26 D Thames St., NEW YORK 6, N. Y.
Technical Service Representatives in All Principal Cities of the United States and Canada

OAKITE — MATERIALS METHODS SERVICE — Buy Bonds for Victory — CLEANING — FOR EVERY CLEANING REQUIREMENT

You Can Obtain MOST of the Essential . . .

"KING" TESTING EQUIPMENT

. . . without Priority

It is now possible to obtain most items of "KING" Testing Equipment for motor tune-up. A WPB ruling enables us to increase production of essential items so that it might be possible to obtain from your "KING" Jobber the testing equipment you need. For many years "KING" Testing Equipment has been used in repair shops all over the world. "KING" has pioneered in this field and many of the most important testing features were developed by us.

"KING" Fast Chargers are now available

Ask Your Jobber or Write Us

The ELECTRIC HEAT CONTROL Co.

9127 INMAN AVENUE • CLEVELAND 5, OHIO

GOOD "KING" PRODUCTS SINCE 1914

Be 100% With 10% • Buy War Bonds

NEW PRODUCTS

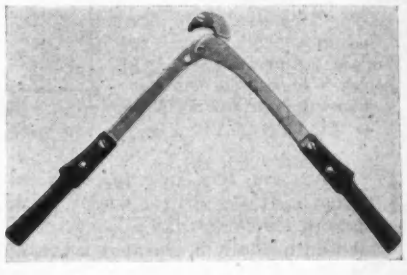
(CONTINUED FROM PAGE 246)

joint. After tensioning with a pull of 1000 lb. within the Loking Tool, the ends are securely locked together under tension without loss of tension within the flat pressed-steel clip, and the excess band cut off flush with the clip so that the entire joint is streamlined for safety.

Use Free Postcard for More Details

P249. Bolt and Cable Cutter

Announcing the development of the new Alport "Lil' Giant" cutter, Techtmann Industries, Inc., the manufacturer, points out the following



features of the 15 in. model illustrated: Only 15 in. overall, weighs only 26 oz. and has a leverage range of 40 to 1. It will cut up to ¼ in. bolts or wires and ⅜ in. stranded cable.

The cutting blades can be fitted to meet any special requirements. The standard blades are made of tool steel and will meet all cutter requirements in general commercial practice. If insulation is desired, the insulated portion will be of plastic with high dielectric strength.

Replaceable cutting blades is another feature.

Use Free Postcard for More Details.

P250. Concrete Treatment

A liquid treatment being offered by E. F. Westfield Co., New York City, is said to stop dusting of terrazzo and concrete floors. It also effectively seals them against water, oils, weak mineral and organic acids.

Known as Westkrete, this material comes ready-prepared for use. It is easily applied with mop, brush, long-handled broom, or sprayed with sprinkler can so as to saturate the area.

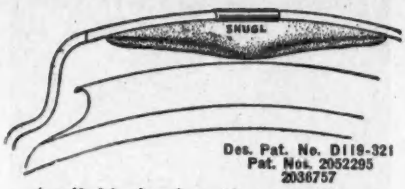
Being almost colorless, Westkrete

(TURN TO PAGE 254, PLEASE)

Economical Truck Operation Includes Tire Trouble Prevention

Whether you operate five, or five hundred trucks, tire maintenance and trouble prevention are very important to the successful operation of your fleet. In fact, whether your trucks are still rolling three months or six months from now will depend very largely on Tire Maintenance.

Regular inspection, proper loading, matching and BALANCING each tire is absolutely necessary in order to obtain maximum mileage. Each time any change is made, if the tire has been recapped or changed to a new position, the wheel assembly should be balanced.



Des. Pat. No. D119-321
Pat. Nos. 2052295
2036757

Available in sizes ½ oz. to 32 oz.

●

Ask for TRUCK CHART ON WHEELS

Many operators have found SNUGL Balance Weights are the answer to this part of the problem.

SNUGL Weights are streamlined to make dynamic balancing easy—have a dove-tail clip that grips, steel against steel, on each side of the rim flange. Easily installed. They cannot rattle or work loose.

MID-WESTERN AUTO PARTS, Manufacturers, 824 E. Elm St., Kokomo, Ind. *Western Distributor:* **Kenneth V. Mills, 910 W. Pico Blvd., Los Angeles, Calif.**

It pays to believe in signs —Sometimes!

We're mighty proud of the one pictured above. It is not only our stamp on a job well done, but is your assurance of well engineered, well constructed machines and tools.

We are currently in production on the following products:

- Valve Seat Grinders
- Valve Insert Tools
- Rod Aligners
- A.C. Arc Welders
- Drill Chucks
- Expanding Mandrels
- Reamer Drives
- Abrasive Wheel Dressers
- Valve Seat Rings

Literature on any or all products will be gladly sent to you on request.

K. O. LEE COMPANY
Aberdeen, South Dakota

EVERY DAY . . . You Need a *Kleer-Flo* PARTS CLEANER

—for quick, safe, mechanical cleaning of parts and tools. Solvent pumped through metal hose, sprays parts, drains off dirt and grease, then flows thru filter. AVOIDS LOSS of small parts. REDUCES FIRE HAZARD. Safety link closes lid at 160° F.

SPEEDS WORK
SAVES SOLVENT
Size 24 x 36"
Capacity 20 gal.

Kleer-Flo
SOLVENT

●

Efficient, fast-drying.

●

Write for information.

PRACTICAL PRODUCTS CO.
2632 Nicollet Ave. **Minneapolis 8, Minn.**

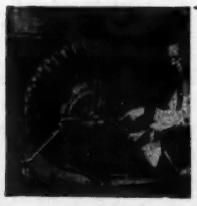
GENUINE ALMETAL PRODUCTS

MR. TRUCK OWNER:

ALMETAL JOBBERS CAN SOLVE YOUR UNIVERSAL JOINT AND DRIVE SHAFT PROBLEMS. CONSULT THEM FOR HELPFUL ASSISTANCE.

★

THE ALMETAL UNIVERSAL JOINT CO.
1555 EAST 55th STREET · CLEVELAND 3, OHIO



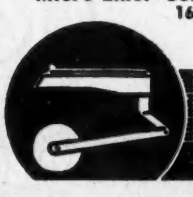
Checks rear wheels as well as front.

Synthetic Tire Troubles Easily Remedied

Synthetic tire troubles can be remedied—in fact, even avoided by taking a few minutes' time to make a Micro-Linor wheel-roll test. It will spot the mechanical defects that are the major cause of excessive wear on rear wheels as well as front. A postcard will bring you full particulars.

Micro-Linor Service Corporation
1629 West Fort Street
Detroit 16, Mich

WRITE FOR CATALOG



MICRO-LINOR
Patented "Tracer-Wheel" Principle

THE COMPLETE LINE
THAT COMPLETELY SATISFIES

THE FITZGERALD MFG. CO., TORRINGTON, CONN.

FITZGERALD
GASKETS

A Name That Grows
Bigger and
Bigger

SIMPLEX
Piston Rings

OVERSIZE REAR WHEEL
STUDS
for all
TRUCKS
Send for
Catalog
Order from
your Jobber

CHAMP-ITEMS
CHAMP-ITEMS, Inc.
6191 Maple Ave.
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GEAR PULLERS

Garage
tools
BUSHING REMOVERS
CREEPER CASTERS
REAMERS
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Cal-Van
MACHINE PRODUCTS INC.
809 WATER ST., JACKSON MICH., U.S.A.

Dart Trucks
HEAVY DUTY FOR
OFF THE HIGHWAY SERVICE
— Specially Designed for —
Coal Mining—Iron Ore Mining—Copper Mining—Pit and Quarry—Logging—Oil Fields—Etc.
It Costs No More for Trucks Specially Built to Fit Your Needs. Have Our Engineers Visit and Analyze Your Operation.
DART TRUCK COMPANY
KANSAS CITY, MO.

Good parts + Good Instalation = VICTORY
Wohlert CORPORATION LANSING MICHIGAN

NEW PRODUCTS

(CONTINUED FROM PAGE 248)

does not affect the appearance of floors. Although it contains no inflammable solvents or volatiles, it dries quickly. Floors can be used as soon as dry.

Use Free Poscard for More Details.

P251. Planishing Machine

With 3100 powerful impacts per minute, the compressed air planshing machine developed by Chicago Pneumatic Tool Co., New York City, is said to "iron out" bends, dents, wrinkles and rough spots in flat, curved or formed metal sheets.

The machine illustrated is 49½ in. high and weighs 150 lb. A unique feature is that the pedestal acts as an air receiver and is equipped with air regulator to control amount of air passing through the tool. Thus, for different materials the impact action of the tool can be regulated accordingly.

Use Free Postcard for More Details.

IN WAR AS IN PEACE
CITIES SERVICE OILS
ONCE-ALWAYS
YOUR SYMBOL OF SERVICE

INNER-SEAL
WATERPROOF
WEATHER STRIPPING
Inner Seal
for
PASSENGER
COMFORT
BRIDGEPORT FABRICS, INC.
BRIDGEPORT CONN.

Permalux
"KOLORFILM" DECALCOMANIA
FIRST IN { APPEARANCE ECONOMY DURABILITY
Still Made With DuPont "DULUX"
Write Today for details
THE PERMALUX COMPANY
900-10 West Lake Street, Chicago, Ill.

The right braking material for any commercial vehicle
CUSTOM-BUILT SETS
CBB SETS
THERMO-BLOCKS
Thermoid
THERMOID COMPANY • TRENTON, N. J.

DAYTON Spoke Type Steel
WHEELS
AIR-COOL
BRAKE DRUMS AND TIRES
FOR TRUCKS, TRAILERS AND BUSES.
THE DAYTON STEEL FOUNDRY CO.
DAYTON, OHIO

VITAL TO—
• Low Mileage Costs
• Easy Operation
• Maintained Schedules

SKF
BALL AND ROLLER BEARINGS

For Engine Bearings
Clutch Plates & Parts
King Bolt Sets

Monmouth is the name

KINNEAR ROLLING DOORS FOR TRUCKS

Save space! Open upward! Coil out of way. Always safe from wind. Can't joggle open! Less chance of damage to doors. *All Metal.* Fireproof! Prevent thefts. Write for details.

The KINNEAR MFG. CO.
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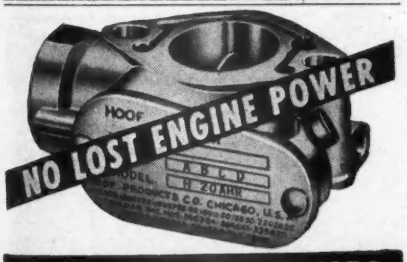
FOR BUILDINGS — *the recognized leader*

ANY MOTOR TRANSPORT HEATING PROBLEMS?

Consult our Engineers

HUNTER AND COMPANY
1560 East 17th Street,
CLEVELAND 14, OHIO



HOOF *FULL POWER* GOVERNORS

SEND FOR FREE BOOKLET
HOOF PRODUCTS COMPANY
6543 SO. LARAMIE AVENUE, CHICAGO 38, ILL.

CLEANER OIL
MEANS
- **Longer Engine Life**
- **Lower Oil Expense**

Write for Bulletin No. 837
MICHIANA PRODUCTS CORP.
Michigan City, Indiana

MICHIANA OIL FILTERS

SERVICE-PROVED

GRUELING years of toughest service prove Blackhawk Hydraulics superior in safety, rugged dependability and utility. "Service-Proved" Seal found only on Blackhawks. Only complete line of hydraulic hand jacks—models up to 50 tons capacity.

BLACKHAWK MFG. CO.
Dept. J1184, Milwaukee, Wis.

BLACKHAWK

CLASSIFIED ADVERTISEMENT

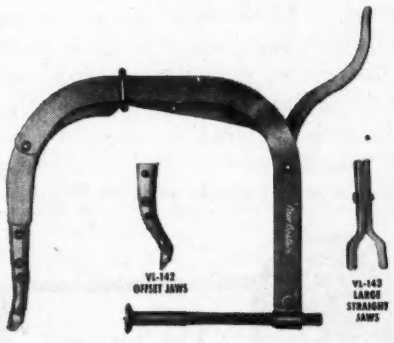
WANTED, PRODUCT TO MANUFACTURE—Leading organization of several hundred skilled designers, engineers, toolmakers and complete modern plant seeks post-war product or machinery. Will develop, manufacture . . if desired will include advertising and sales. Royalty basis or any other satisfactory arrangement. Box 61, Commercial Car Journal, Chestnut & 56th Streets, Philadelphia 39, Pa.

NEW PRODUCTS

(CONTINUED FROM PAGE 254)

P252. C-Frame Valve Lifter

A new, practical valve spring compressor, designed for swift, efficient service in handling the stiffest valve springs is being marketed by New Britain Machine Co., New Britain, Conn.

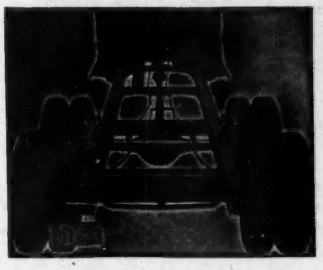


Here are the principal features: Handle is positioned in a C-Frame to

(TURN TO NEXT PAGE, PLEASE)

LITTLE GIANT
AUTOMOTIVE TRUCK EQUIPMENT

TEN WHEELERS
for 1½ to 5 Ton Trucks

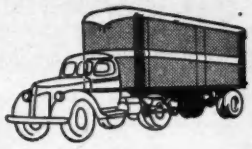


Greater tonnage . . . more profit. Increase carrying capacity up to 20 tons. Extend frame to any desired length. Load kept in perfect balance . . . no teeter or end-sway. Simple, sturdy, no intricate parts. Timken bearings; steel castings; hydraulic brakes. Easily installed in 3 hours. 3 sizes. *LOW COST. No priority rating required.*

Also makers Little Giant Frame Extensions, Hand Hoists, Wrecking Cranes.

Write for Circulars, Low Prices

LITTLE GIANT PRODUCTS, INC.
1532 No. Adams **Peoria, Illinois**



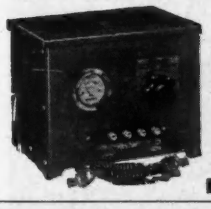
★ Keystone Stock Racks, Grain Trailers, Vans, Refrigerator and Platform Trailers are available for immediate delivery. Write—

KEYSTONE
TRAILER & EQUIPMENT CO., Inc.
2104 E. 10th St., KANSAS CITY, MO.

BALDOR

BATTERY CHARGERS

Improved ventilation for cool operation, longer life and greater efficiency. They stand the strain of peak loads.
12-batt. size....$28.00
less bulb



BALDOR ELECTRIC CO.
4340 Duncan Ave.
St. Louis 10, Mo.

Oldforge QUALITY TOOLS

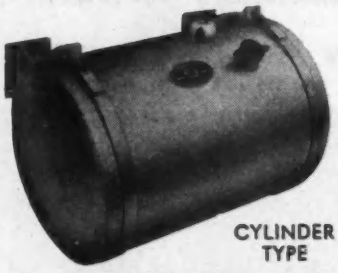
OLDFORGE tools have been forged and treated by Master toolsmiths for over 19 years; beginning with the natural ores and ending with a rigid inspection.

For years our products have been known to the trade to have a quality inferior to none.

New instruments to meet new mechanical conditions are continually being produced.

If you have not yet enjoyed the thrill of performance, or the pride of ownership of a **QUALITY TOOLS** product, see your distributor or write us direct. The modest cost will surprise you.

QUALITY TOOLS CORP. *New Wilmington, Pa.*

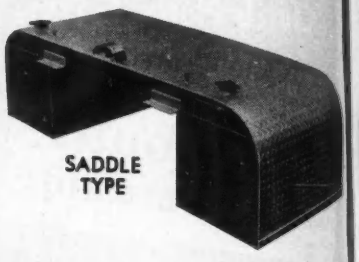


CYLINDER TYPE

You must get the MOST from your present truck equipment to keep War Material moving.

Large capacity SNYDER (patented) Safety Fuel Tanks will eliminate unnecessary refueling delays. By the use of the Flame Guard Safety Valve (standard on all Snyder tanks) added protection is afforded against fire hazards. Capacities range from 28 to 50 gallons in the cylinder type; 75 to 125 gallons in the saddle type. Approved by the Underwriters' Laboratories, Inc.

Distributed in all principal cities. Write for descriptive literature.



SADDLE TYPE

SNYDER MANUFACTURING CO. Dept. CC BUFFALO, N. Y.

KOETHERIZING

The one best way to restore collapsed pistons to original factory fit.

•

Every pulled piston should be Koetherized.

KOPPERS COMPANY
American Hammered Piston Ring Div.
BALTIMORE, MD.

Better—but *not* more expensive!

SHULER AXLES

SHULER AXLE CO.
LOUISVILLE, KY.

KING BEE

"... pioneers in safety equipment"

lamps • mirrors • reflectors • flares

AMERICAN AUTOMATIC DEVICES CO.
Harrison, Throop and Congress Streets
CHICAGO, ILLINOIS

NEW PRODUCTS

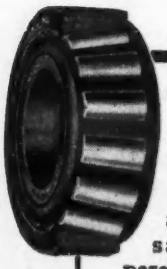
(CONTINUED FROM PAGE 255)

avoid high fenders, hood and tie rods. Loose ring attachment on frame may be moved to hold tool locked in any desired position. Easy adjustment for any valve stem length. Slim, rugged jaws give maximum room to remove or replace valve keys.

Inside depth of frame: 11½ in., inside width 8¼ in., with 10½ in. opening capacity using offset jaws, 11½ in. capacity using straight jaws. Allows enough clearance to use tool without removing manifold. Complete with VL-141 standard equipment jaws shown on lifter, and VL-142 offset jaws shown in center of lifter. For work on large motors, VL-143 large jaws (shown at right of lifter) are available, at extra cost.

A priority rating of AA-5 or higher is required for the purchase of these tools.

Use Free Postcard for More Details.



The cost and time required to install a genuine Timken Bearing are exactly the same as any tapered roller bearing.

THE TIMKEN ROLLER BEARING COMPANY
CANTON, OHIO

For a Smooth, Safe Ride at Lower Cost, Use

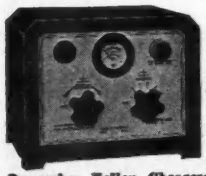
CLE-AIR

Hydrau-Matic Shock Eliminators

★ ★

The Cleveland Pneumatic Tool Co.
Cleveland, Ohio

VALLEY CHARGERS HAVE Gone To War



For the Duration . . . we will not be able to supply Valley Chargers to our many customers and prospects because our war production demands, otherwise, take up our entire facilities.

Remember Valley Chargers . . . when we can again supply you with these simple, efficient and economical battery-charging units.

Valley

VALLEY ELECTRIC CORP.
4221 Forest Park Blvd., St. Louis, Mo.

McCREARY TIRES

"Built for Longer Service"

For heavy duty service

KATHANODE

FOR BUSSES & TRUCKS

THE ORIGINAL SPUN GLASS BATTERY

THE KATHANODE CORPORATION, Chicago, Ill.

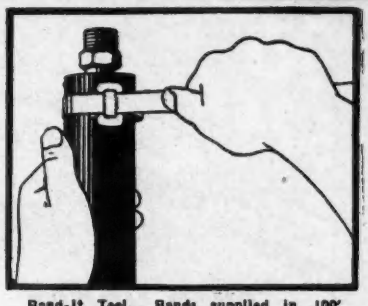
Tal's Pipe Bender. Style 2 bends ⅜" to 2" pipe. Style 3, ½" to 3" pipe. Complete, ready to use.

Pipe Bender That Bends Pipe Cold
Band-It Tool That Bands Everything

TAL'S PIPE BENDER bends pipe ⅜" to 3" dia. Produces smooth, uniform bends. Hydraulic principle makes it easy to operate with one hand. Compact. Portable. Eliminates elbows, fittings. Saves critical materials.

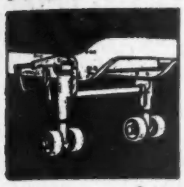
BAND-IT TOOL bands everything — hose, pipe, boxes, barrels. With steel band and buckles to fit, Band-It repairs leaks or breaks in pipe or hose. Useful for binding, supporting, reinforcing. Bands any dia. from ¼" to 30". Soon saves its cost. *Request Details*

AMERACO Industrial Specialties
122 S. Michigan Ave., Dept. O, CHICAGO 3, ILL.



Band-It Tool. Bands supplied in 100' rolls, ⅜", ½", ⅝", ¾" and buckles to fit.

AUSTIN THE ACCEPTED STANDARD . . .



A complete line of LANDING GEARS.... HORIZONTAL, VERTICAL and FOLDING TYPES

Write for complete information on "SAFETY PROPS" and FIFTH WHEELS

AUSTIN TRAILER EQUIPMENT COMPANY MUSKEGON MICHIGAN

VICTOR
GASKETS, OIL SEALS
GREASE RETAINERS

RBC
ROLLER BEARINGS
help Transport Men and Material
over the Road
ROLLER BEARING COMPANY of AMERICA
TRENTON . . . NEW JERSEY

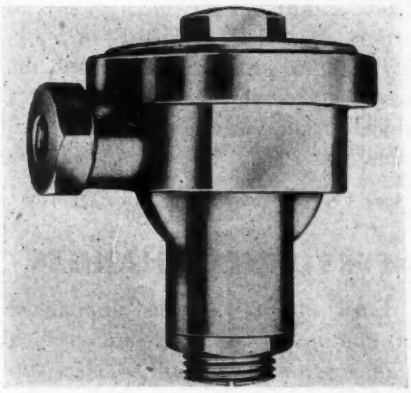
O.D.T. SAYS
TRUCKS are fighting equipment vital to Winning War..
KEEP YOURS FIRING
..every cylinder at Top Efficiency!
RAMCO PISTON RINGS 10 up

NEW PRODUCTS

(CONTINUED FROM PAGE 256)

P253. Oil Pressure Switch

A new snap-action pressure switch, recommended for use on bus or truck engine oiling systems to prevent the damage that usually results from lack of proper oil pressure has been introduced by Hawk Tool & Engineering Co., Detroit.



When the oil pressure in the engine oiling system drops below a selected pressure range, Pressure-Clix closes its contacts and, thereby, a circuit. This circuit can be used to energize a relay that, in turn, will short out the ignition or close the fuel solenoid on a diesel engine. The contacts of the Pressure-Clix have a capacity to carry

(TURN TO NEXT PAGE, PLEASE)

The Spot Lite is on KEX TIRE PLUGS
The Perfect Puncture Seal for Synthetic and Natural Rubber Casings. Three sizes meet all needs
ASK YOUR SUPPLY HOUSE
PAT. FEB. 4-1941 KEX REG. U.S. PAT. OFF.
The WEDLER-SHUFORD CO. ST. LOUIS, MO.

BUELL air Horns

"KEEP THEM ROLLING"!

Buell High Pressure Air Horns not only provide a highway signal of proven safety, but they also are a dependable source of air for tire inflation, *right with the Truck at all times.*

AIR COMPRESSOR

If your specification sheet calls for an air compressor to pump to 600 pounds, to occupy a space of not more than 3 x 5 x 8 inches and to weigh less than 10 pounds, then call on Buell. We make them for mounting on aircraft engines where highest quality and performance are a prime requisite.

BUELL MANUFACTURING CO.
2938 COTTAGE GROVE AVE., CHICAGO, ILL., U.S.A.

KEN-TIRE TOOLS
KEEP AMERICA'S KEY TRANSPORTATION ROLLING!

KEN TIRE TOOLS
SEE YOUR LOCAL JOBBER OR WRITE FOR ILLUSTRATED LITERATURE
THE KEN TOOL MFG. CO. AKRON, OHIO

Gabriel
HYDRAULIC SHOCK ABSORBERS

The GABRIEL Company
ESTABLISHED 1904 • CLEVELAND 14, OHIO

even under
HEAVY LOADS

LINK-BELT
ROLLER BEARINGS

Built to give free rolling service under heavy loading, they increase the efficiency and life of every type of automotive equipment. For front wheels, rear axles and differentials.

Made by makers of famous LINK-BELT Silverstreak Silent Timing Chain.

9458

LINK-BELT COMPANY
519 N. Holmes Ave., Indianapolis, Ind.
Warehouses in all principal trading centers

Speed up your battery testing and assure greater accuracy

— by using an
IMPERIAL "K"
No. 515-T
BATTERY
HYDROMETER

Has shatterproof glass jar—will stand up under hard knocks.

Thermometer type — corrects for variations in temperature.

Net price to Fleet Owner..... $1.35 ea.

Order from Your Jobber

THE IMPERIAL BRASS MFG. CO.
1209 W. Harrison St., Chicago 7, Ill.

Easy Maintenance
WITH THIS 1/16" SHIM THE ASF 5th WHEEL CAN BE SLACK CONTROLLED
Shim without removing 5th Wheel!

FULL INSTRUCTIONS WITH EVERY WHEEL OR WRITE:

ASF Safety 5th Wheel
AMERICAN STEEL FOUNDRIES
Automotive Division, 400 N. Michigan, Chicago 11

NEW PRODUCTS

(CONTINUED FROM PAGE 257)

30 amp. non-inductive load or 20 amp. inductive load, making it unnecessary to use a relay if none is available. An alarm also can be sounded by hooking into the overheat buzzer if this arrangement is preferred.

Pressure-Clix is available in four different pressure ranges from 0 to 28 lb. and higher pressures on special order. Installation consists of hooking a 1/8 in. pipe connection into the switch and hooking ignition, relay or alarm circuit in series with the contacts.

Use Free Postcard for More Details.

PERSONNEL CHANGES

Ford Motor Co. has announced promotion of six assistant branch managers to managerships. These include George T. Montagnet, New Orleans; Ray A. Grimmer, Milwaukee; Harry M. Lidgard, Pittsburgh; John W. Schwer, Fargo, and Nelson F. Bowe, Los Angeles. Edward F. Hughes, sales manager of the Richmond, Cal., branch, has been made assistant manager to succeed Schwer.

F. F. Sampson, manager of the New York branch, The Electric Storage Battery Co., Philadelphia, retired on July 1 after 30 years of service. Daniel P. Orcutt, assistant

OVER 70% OF ALL MAKES OF TRUCKS AND BUSES ARE Zollner EQUIPPED

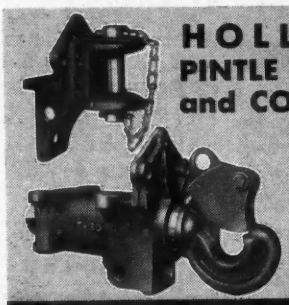
ZOLLNER
HEAVY DUTY PISTONS
ZOLLNER MACHINE WORKS FORT WAYNE, IND.

HEADQUARTERS

MOOG SPRING SUSPENSION SERVICE

ELECTRICALLY HEAT TREATED SPRINGS
COIL ACTION REPLACEMENT PARTS for COMPLETE SPRING SUSPENSION SERVICE

MOOG INDUSTRIES, INC., ST. LOUIS 14, MO.
ST. LOUIS SPRING CO. MOOG COIL ACTION-PARTS CO.
MOOG PISTON RING COMPANY



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PERSONNEL CHANGES

(CONTINUED FROM PAGE 258)

manager since 1921, succeeds Mr. Sampson as manager.

J. E. Powers has assumed special sales duties in tire department of The General Tire & Rubber Co. in Akron. David Coan, Buffalo territory salesman, replaces Mr. Powers as New York branch manager.

D. F. Geisey has rejoined the staff of Studebaker's National Accounts Division. He has been assigned to Studebaker's eastern region.

W. C. Dodge, Jr., has been elected vice-president of Ferodo & Asbestos, Inc., New Brunswick, N. J.

Paul F. Jones has been made assistant general sales manager of Joseph Weidenhoff, Inc., Chicago. He was formerly with the Goodyear Tire & Rubber Co. and the Willard Storage Battery Co.

Al T. Hudson has joined the staff of Petroleum Solvents Corp. of New York and is now operating under Stafford Jones, district manager in the Southwest.

Jack Palmer has been appointed Lubrication Equipment Division manager of the New York Metropolitan territory of the Aro Equipment Corp., Bryan, Ohio.

C. R. Moss has been placed in charge of advertising and sales promotion of The Haskelite Mfg. Corp.

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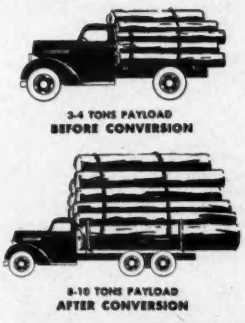

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